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A MARKET SEGMENTATION STUDY ON ELECTRONIC CALCULATORS AS A HOUSEHOLD PRODUCT IN HONG KONG

by

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ABSTRACT

Calculators have been imported mainly from other countries for many yearsand the local market has been dominated by the Japanese from the start. However, in late sixties our local manufacturers recognized there was a significant local market and began to enter this market thus triggering a competition war among the various brands. But it is a pity that most local manufactuters and importers do not use market research to find out the needs of the customers and segment the market accordingly. So the objective of this study is to learn how the products are perceived by the customers, retailers and manufacturers.

Manufacturers were interviewed personally by the author while mailed questionnaires were sent to the retailers and consumers. The main finding was that manufacturers, retailers and customers do perceive products differently in terms of price, quality, brand image, feature and body design. We also observed that the manufacturers have some idea on market segmentation while the retailers were still in the dark.

This thesis is only exporatory in nature and by no means a complete study of the segmentation on calculator market in Hong Kong. It is only intended as a guide for those who are interested in the topic. We sincerely hope that they find it will be useful to them.

FOREWORD

I wish to take this opportunity to express my sincere gratitude to a number of persons for their generous help and guidance in the accomplishment of this thesis.

My greatest debt is to my thesis supervisor, Dr. K. H. Lee, Lecturer at the Chung Chi College, Chinese University of Hong Kong, for his encouragement and guidance throughout the entire period of this study. Professor H. Sutu, our Institute Director, was of great help to me in making constructive criticism and valuable suggestions. I thank my Intra-Departmental Examiner, Dr. Charles F. Steilen, Visiting Associate Professor at the Institute and my External Examiner, Professor Lee E. Preston, State University of New York at Buffalo for their precious opinions.

Finally, I would like to thank Miss Eleen Chan for typing this thesis.

Kwan Wing Hon, Michael

Hong Kong

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1.0 INTRODUCTION

1.1 Justification and Objective of the Study

In the past Hong Kong manufacturers were just producers of goods with their emphasis mainly on the production side and little concern about the marketing aspects of business. One of the main reasons is that most of the products they produced were for exports and they manufactured according to the buyers' specifications. The consequences were that the local manufacturers depended very much on the marketing efforts of others and few knew much about marketing.

But up to the early sixties situations changed. Due to the large number of immigrants from Mainland China, coupled with the ever-rising economy and higher education levels of people in Hong Kong in the early seventies, the manufacturers began to recognize that there was a significant local market. As a result, the manufacturers began to push the products into the local market with only one single strategy - low pricing. This strategy worked for a while; however, as the education level of people increased along with the economy, people tended to diversify in their consumption patterns, and the manufacturers began to understand the importance of the marketing concept.

The electronic calculator industry is a typical case. At the beginning the manufacturers only produced according to the specifications of their buyers and the products were mainly for export. Only until recently did local manufacturers of electronic calculators

regard Hong Kong as a market and begin to develop their own marketing programs. In the early seventies the calculator firm tried to shift the focus of management from the problems of production toward understanding and catering to the needs of customers and they recognized that the customer was at the top of the organization chart.

The way in which the manufacturers or retailers perceive the needs of the customers may be quite different from the way the customers see their needs. There is usually a gap in between these two. This situation may be more true in Hong Kong where most firms do not carry out market research. For example, the Kentucky Fried Chicken Company believed Hong Kong people liked to eat fried chicken as well as the Americans do. However, it turns out that the Chinese people have a different way of cooking chicken. This led to a complete failure of Kentucky Fried Chicken business in Hong Kong in 1972. However, McDonald did a very careful analysis on the consumer taste before it opened its first branch in Causeway Bay.[1] Thus, it is very important that manufacturers and retailers know exactly the needs of customers. It is a pity that most Hong Kong manufacturers do not use market research to obtain such information but only depend on their intuition. As a result, it is the objective of this study:-

(i) to learn how products are perceived by customers, manufacturers and retailers;

(ii) to compare the perception discrepancy between these groups; and

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[1] The company hired a student from Lingnan Institute of Business Administration to carry a consumer survey as part of its market survey in Summer, 1975.

(iii) to determine the implications of this discrepancy in the strategy of market segmentation.

1.2 Scope of the Study

At present the market for electronic calculators is divided into two sectors; the final users and the intermediate buyers. The final buyers include those who only buy the calculators for final use, i.e., the users and potential users, and excludes those who are the intermediate buyers.

At this point an operational definition of electronic calculators is given to avoid confusion. Electronic calculators refer to those calculating machines operated by electronic circuits without the capacity to read in any form of source program. Thus, it will exclude the mini-computers, micro-processors, the electromechanical adding machines and cash registers.

It is expected that in the near future, due to the keen competition in the commercial segment of the calculator market, that Asian producers, including Hong Kong manufacturers, will diversify their markets. One of these markets, as reported by a trade magazine,[1] is the student market which is a large potential market. Thus, the subjects in this study will be limited to students; but, in view of the man-power, money and time available, the study will only concentrate on the students of the two universities, namely the University Hong Kong and the Chinese University of Hong Kong. However, medical students are not included due to their distinct behavior in the

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[1] "Surge in Demand Strains the Source Market," Asian Sources, Electronics, Vol. 5/No. 5 (Hong Kong: Trade Media Ltd., 1975) p. 9.

University of Hong Kong. In the study on the channel members, the subjects included local manufacturers and retailers.

Details on the sampling design, the questionnaire design and data collection are discussed in Chapter IV. A plan of this thesis is given in the next section.

1.3 Plan of the Thesis

This thesis consists of a total of six chapters. This beginning chapter gives the reasons why the study is carried out, the objective of the study and the scope that it will cover.

Chapter II describes the structure and development of the electronic industry in Hong Kong with special attention on the calculator sector. The marketing aspects and production aspects of the industry are also outlined in this chapter.

Chapter III is a literature review on the theory of market segmentation, the importance and implication of the segmentation bases in the market segmentation strategy.

A description of the methodology of this study is given in Chapter IV. In this chapter the sampling design, the questionnaire design and the method of collecting data is given. The section discusses the method of analysis of data. Analysis of data will mainly rely on cross-tabulation and semantic differentials.

Chapter V is the analysis of data. It includes the construction of semantic differential patterns of both customers and retails and then comparison of these two to find out the discrepancy.

The last chapter, chapter VI, is the summary of findings and conclusions. Recommendations for market segmentation strategy are given.

In the next chapter we are going to take a look at the structure and development of the electronic industries in Hong Kong.

2.0 GENERAL OVERVIEW OF THE ELECTRONIC INDUSTRY IN HONG KONG

2.1 Development and Structure of the Industry

Development of the electronic industry in Hong Kong

Hong Kong's electronic industry is relatively new compared to textile and garment industries. With only two firms and just over a hundred employees manufacturing transistor radios using Japanese germanium devices in 1959, the industry rapidly gathered momentum and remarkable developments took place in the ensuring decade.

By 1963 there were 28 factories employing a labour force of nearly 2767.[1] By 1973, the number of establishments rose to 390 with nearly 48,000[2] workers or over 9 per cent of the total industrial labour force in Hong Kong. Due to the world-wide inflation and economic recession in 1974, the number of firms droped slightly to 320[3] still employing a total work force of 47,000.[4] Table 2.1 shows the figures for the period 1963 - 1974.

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[1] Hong Kong Census & Statistics Department, Hong Kong Monthly Digest of Statistics, March, 1964, p. 4

[2] Ibid., March, 1974, p. 4

[3] Ibid.

[4] Ibid., March, 1975, p. 4

TABLE 2.1

NUMBER OF FACTORIES AND WORKERS EMPLOYED AT YEAR END IN ELECTRONIC INDUSTRY

Year	No. of Factories	No. of Workers Employed
1963	28	2,767
1969	146	32,234
1970	223	32,448
1971	281	35,200
1972	305	42,222
1973	390	47,975
1974	320	37,535

Source: Hong Kong Commerce and Industry Department, Industry Factory Sheet, Electronic Industry in Hong Kong, August, 1975

However the first electronic calculator was not manufactured until 1971 with the establishment of one electronic calculator firm. By the end of the first half of 1975 there were a total number of 27 firms employing 8,800 people.[1] A name list of the firm is given in Appendix A.

Structure of the industry

Similar to the general structure of the Hong Kong industry, the electronic industry is characterised by small establishments. Nearly 60 per cent of the factories today are small ones employing less than 100 workers, while 28 per cent are of medium size employing

[1] Hong Kong Commerce and Industry Department, Industry Factory Sheet, Electronic Industry in Hong Kong, August, 1975.

between 100 to 500 workers with the remaining 7 per cent employing 500 or more workers. Table 2.2 shows the breakdown of the size of factories by the number of the whole electronic industry. Table 2.3 shows the breakdown of calculator firms only.

TABLE 2.2

SIZE OF ELECTRONIC FACTORIES BY NUMBER OF EMPLOYEES

Year (31st March)	Total	500 & Over	200-499	100-199	50-99	1-49	Temporarily ceased operation
1969	114	15	21	25	18	30	5
1970	173	15	31	28	35	53	11
1971	222	14	28	42	40	87	11
1972	280	17	29	46	54	122	12
1973	315	23	38	50	48	141	15

Source: Hong Kong Commerce and Industry Department, Industry Factory Sheet, Electronic Industry in Hong Kong, August, 1975.

TABLE 2.3

SIZE OF CALCULATOR FIRMS BY NUMBER OF EMPLOYEES AS OF MARCH 31, 1975

Number of employees	Number of firms
Below 100	15
101 - 200	2
201 - 300	2
301 - 400	2
over 400	7

Source: Hong Kong Commerce and Industry Department, Industry Factory Sheet, Electronic Industry in Hong Kong, August, 1975.

Although the industry now consists largely of small firms owned by local people, foreign participation has played a significant part in the development of the industry. Many large international firms have subsidiary plants (e.g. Ampex - Ferrotec, Fairchild Semiconductor Ltd. are typical), or have entered into joint ventures with industrialists in Hong Kong. The same feature occurs in the calculator sector of the electronic industry and to name a few, Realtone Electronics Ltd. and Sonca Industries Ltd. are the subsidiary plants of Japan and American Corporations.

At the end of May 1974 there were 52 factories with foreign interests either as foreign-owned subsidiaries or as joint venture enterproses. The total foreign investment involved amounted to over HK$311 million, the bulk of which originated in America (78%) followed by Japan, the United Kingdom, Netherlands and Singapore.[1]

2.2 The Marketing Aspect of the Industry

Products of the electronic industry

Since the starting of the assembly of transistor radios in 1959, the electronic industry in 1963 branched into the manufacture of electronic components. Today, the electronic industry continues to widen its range of products including consumer goods such as tape-recorders and electronic calculators. The full range of products manufactured today include the following:[2]

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[1] Ibid.

[2] Ibid.

Transistors

Semi-conductors

Integrated circuits

Thermionic and electronic tubes & valves

Electrical condensers

Transistorized radio broadcast receivers

Parts for transistorized radio broadcast receivers

Radio chasis

Microphones, loudspeakers and amplifiers

Radio transmitter receivers

Wireless television broadcast receivers

Parts for television broadcast receivers

Transistorized gramophones, record players, automatic record changers

Computer memory core planes, arrays and stacks

Transistorized tape recorders

Electronically controlled toys

Clock radios

Electronic calculators

Cassette tape recorders

Television antennae

Judging from the products that the industry produces we can see the diversification took place during the last decade in the industry.

In 1963 the total domestic exports of major electronic products, which consists of only transistor radios and parts for television broadcast receivers, was only HK$71.2 million. By the end of

1973 the whole industry contributed $2,424.5 million to Hong Kong's domestic exports, and today it is the second largest export earner, accounting for 12.4 per cent[1] of the total domestic exports. Table 2.4 shows the domestic exports of major electronic products. Notice should be given to the growth of electronic calculator exports. In 1971 the amount of calculator export was only HK$0.9 million, but in 1972 the figure jumped to HK$21.3 million giving a growth rate of more than 200%. In 1973 a growth rate of 300% was encountered giving an export value of HK$97.7 million. However the growth rate slowed down to 55% in 1974 giving an export value of HK$154 million.

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[1] Hong Kong Government, Hong Kong 1974, p. 13.

TABLE 2.4

DOMESTIC EXPORTS OF MAJOR ELECTRONIC PRODUCTS

Value: HK$ Million

Item	1963	1969	1970	1971	1972	1973	1974
Transistor radios	68.3	472.1	548.8	711.7	920.2	1,159.1	1,313.3
Memory core	-	27.6	175.3	284.6	279.3	399.3	465.5
Transistors	-	232.6	210.8	187.5	228.5	331.4	314.1
Calculators	-	-	-	0.9	21.3	97.7	154
Semiconductors & IC	-	-	-	4.6	48.3	90.5	229.2
Parts for transistor radio	2.9	14.3	21.4	41.8	51.6	82.3	109.0
Parts for television broadcast receivers	-	53.3	39.4	72.8	70.6	72.6	58.9

Source: Hong Kong Census & Statistics Department, Hong Kong Trade Statistics Exports and Re-Exports, Dec. 1963, 1969 - 1974.

Markets for the major products

The electronic products are manufactured both for sales in the local market and for export. A large proportion of locally made components and parts is absorbed by the finished products sector, and it is estimated that about 25% of production from this sector is sold to the local market. The major foreign markets include U.S.A., U.K., Germany F.R., Taiwan, Canada, Netherlands and Japan, with the U.S. market occupying more than 50 per cent of the domestic exports of electronic products. Table 2.5 gives a picture of the sizes of the various foreign markets.

TABLE 2.5

DOMESTIC EXPORTS OF ELECTRONIC PRODUCTS

Value: HK$ Million

	1963	1969	1970	1971	1972	1973
Domestic Exports of which to	71.2	827.8	1,074.0	1,383.9	1,740.0	2,424.5
U.S.A.	27.1 (38%)	621.9 (75.1%)	767.4 (71.5%)	944.4 (68.2%)	1,129.1 (64.9%)	1,400.2 (57.8%)
U.K.	32.0 (44.9%)	32.9 (4.0%)	55.9 (5.2%)	87.2 (6.3%)	142.2 (8.2%)	214.5 (8.8%)
Germany F.R.	1.7 (2.3%)	31.4 (3.8%)	48.2 (4.5%)	61.4 (4.4%)	97.3 (5.6%)	169.5 (7.0%)
Taiwan	-	12.8 (1.5%)	18.5 (1.7%)	74.6 (5.4%)	49.6 (2.9%)	98.2 (4.1%)
Canada	1.8 (2.5%)	13.2 (1.6%)	14.6 (1.4%)	35.9 (2.6%)	49.7 (2.6%)	56.3 (2.3%)
Netherlands	0.7 (1.0%)	7.7 (1.0%)	11.6 (1.1%)	19.1 (1.4%)	29.1 (1.7%)	54.5 (2.2%)
Japan	-	28.1 (3.4%)	36.1 (3.4%)	18.7 (1.4%)	17.0 (1.0%)	43.1 (1.8%)

Source: Hong Kong Census & Statistics Department, Hong Kong Trade Statistics, Exports and Re-Export, Dec. 1963, 1969 - 1973.

Now let us look at the export markets for electronic calculators. Table 2.6 shows that the U.S. market is still the dominant market with Germany F.R. and U.K. come the second and third.

TABLE 2.6

EXPORT MARKETS FOR ELECTRONIC CALCULATORS

Value: HK$ Million

	1970	1971	1972	1973	1974
Total	-	0.89	21.26	97.71	154.8
U.S.A.	-	0.29 (32.6%)	8.46 (39.8%)	28.81 (29.5%)	40.4 (26.1%)
U.K.	-	0.03 (3.4%)	3.76 (17.7%)	13.48 (13.8%)	22.5 (14.5%)
Germany F.R.	-	0.34 (38.2%)	4.82 (22.7%)	17.07 (17.5%)	24.6 (15.9%)
Taiwan	-	0.01 (1.1%)	0.04 (0.2%)	1.30 (1.3%)	1.2 (0.7%)
Canada	-	-	0.01 (0.04%)	0.25 (0.3%)	2.63 (0.7%)

Source: Hong Kong Census & Statistics Department, Hong Kong Trade Statistics, Exports and Re-Exports, Dec. 1970 - 1974.

Competition in the local market

At present, besides the products manufactured by local firms, the calculator market consists of about thirty foreign brands of calculators with more than one hundred models.

The calculators can be divided into several groups according to their place of origin. The major suppliers are Japan, Taiwan, U.S., Singapore and Hong Kong. Table 2.7 shows the import figure both in value and quantity for the above four foreign countries. Japan is the biggest supplier occupying over 70 per cent of the total import market for all years with the other three countries occupying an insignificant

amount. In 1974, the total number of import calculators amounted to nearly 260,000 sets which are valued at HK$55 Million. However, it is interesting to note that the import share of Japan decreased to 78 per cent in 1974 as compared to the previous years' figure of nearly 90 per cent.

From Table 2.7, there is no doubt that Japanese products dominate the local calculator market. Among them Casio, Sanyo and Sharp are the leading brands. Sharp, being the pioneer in calculator assembly, explored the local market in the mid-sixties and established its position easily. Later came the other Japanese brands competing with each other. By the early seventies the first local manufacturers, Colex, entered the market with a very low price and was able to develop its own market. At present, there are so many brands competing against each other that no single brand can dominate the market.

One further factor that accentuates the problem of competition is the continuous lowering of the retail price of a 4 function-plus-percentage calculator to the present value of HK$50.[1] Thus profit margin is squeezed both for the retailers and manufacturers/importers. And as a result the manufacturers and importers either go into the more sophisticated model with more features or just stop marketing/producing the 4 function-plus-percentage model. The author found that, of the 27 local manufacturing firms, four have already dropped their calculator line.

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[1] "Surge in Demand Strains the Source Market," Asian Sources Electronics, Vol. 5/No. 5 (Hong Kong: Trade Media Ltd., 1975) p. 9.

TABLE 2.7

IMPORT OF CALCULATORS BY MAJOR SUPPLYING COUNTRIES

Year	1970		1971		1972		1973		1974	
Country	Quantity (No.)	Value (HK$)	Quantity (No.)	Value (HK$)	Quantity (No.)	Value (HK$)	Quantity (No.)	Value (HK$)	Quantity (no.)	Value (HK$)
Total	7,400	10,321,664	19,696	21,197,052	226,031	77,387,136	248,151	83,225,628	256,836	55,268,870
Japan	4,314	7,394,411 (71.6%)	17,055	18,550,237 (87.5%)	213,689	69,427,568 (89.7%)	233,740	74,525,000 (89.5%)	214,703	43,147,118 (78%)
U.S.A.	104	242,239 (2.3%)	316	473,076 (2.2%)	2,930	2,214,907 (2.9%)	3,364	2,398,472 (2.9%)	14,965	3,961,733 (7.2%)
Taiwan	230	64,530	4	10,848 (0.1%)	4,576	1,533,817 (2.0%)	5,495	1,774,393 (2.1%)	15,062	2,764,052 (5%)
Singapore	5	6,095 (0.01%)	6	17,397 (o.1%)	1,476	2,152,542 (2.8%)	2,051	2,376,232 (2.9%)	3,334	2,425,156 (4.4%)

Source: Hong Kong Census & Statistics Department, Hong Kong Trade Statistics, Imports Dec. 1970 - 1974.

Demand for electronic calculator in Hong Kong

Perhaps one of the main reasons for such a large demand for electronic calculators is its accuracy in chain calculations. Before the introduction of electronic calculators most business firms, which are the main users of calculators, used an abacus and electro-mechanical calculation machine. The trouble in using these machines is that they are quite cumbersome to operate and time concuming. However, the electronic calculator is easy and quick to operate, and the answers are accurate. With the addition of more features like memory, percentage and present value, most business people now mainly rely on the electronic calculators instead of abacus and the electro-mechanical calculating machines for calculation.

At present the primary users are the business men working in the office. They mainly use the calculators for addition and subtraction so that a four-function-plus-percentage model is suitable for them. The next largest group of users, which is also the highest potential market, is the student market. They usually demand the scientific model which consists of trigonometric functions and other scientific operations. It was once said by an executive of a calculator firm that the calculator would become a personal item for every student if the examination rules allowed the use of calculators in examinations.

2.3 The Production Aspect of the Electronic Industry

Sources of supply of materials

In Hong Kong all the electronic calculator firms do only the assembly work and buy the assembly parts from outsiders. The assembly

parts can be mainly divided into two main groups:

(i) the electronic parts which include the chip/LSI[1] and the digital display,

(ii) the mechanical parts which include all other parts except electronic parts.

For most of the smaller firms, the mechancial parts and electronic parts are purchased. However, some of the larger firms, e.g. Sonca Industries Ltd., do make some of the plastic parts themselves. The source of supply of the semi-finished assembly parts, except the chips and the digital display, are mainly the local firms. The chips and digital displays come from different sources. At the beginning they were dominated by the American source. The Japanese together with the German products then came into the market. Recently most firms have found it much cheaper to buy Taiwan products. But the Hong Kong manufacturers do not have much choice among these various sources. In fact the present situation is just the reverse. The manufacturers have found themselves in a situation where there is no reliable source of supply for these two parts. This is primarily due to the fact that suppliers always delay the delivery in order to satisfy the big account first, e.g. Sharp and Sanyo. The situation was worse in late 1975 when "a sharp turnaround in calculator buying hit the Asian source market".[2]

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[1] LSI is the short form of large-scale integrated circuitry whose function is equivalent to the brain of man.

[2] "Surge in Demand Strains the Source Market," Asian Sources Electronics, Vol. 5/No. 5 (Hong Kong: Trade Media Ltd., 1975) p. 9.

Cost structure of electronic calculator

In the manufacturing/assembling of electronic calculators the material cost constitutes to be over 80 per cent[1] of the total cost. The chip and digital display cost more than three-fourths of this portion. Thus, prices of these two electronic parts are the key factors in determining profit margin and competitive position.

In 1972, the cost of a displsy was about US$8.00 for an 8-digit LED[2] display while a 4-function chip was US$7.00. The sum of these two is US$15.00 or HK$75.00, and together with other costs gives rise to a cost of HK$120.00 per calculator. However, the prevailing selling price of a calculator at that time was around HK$180.00. This left only HK$60.00 for the manufacturers, the sole agents and the retailers. From this we can see the profit squeeze suffered by these members for the last two years. During this time the price of the calculator continued to drop dramatically to the present price if HK$50.00.

The continuous rise of labour costs and other factory overhead has added to the problem. In 1972 the average labour wage in the electronic industry was about HK$17.00 but it rose to HK$20.00 in 1975.[3] Since the industry involves much assembly work, the labour cost can only be reduced by a substantial amount through large scale production. However, since most of the local manufacturers are small, it is foreseeable that the labor cost will be controlled more tightly

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[1] The figure is estimated by the author who worked in a calculation firm for two years.

[2] LED refers to light-emitting diode which is one kind of digital display besides fluorescent tube and liquid crystal display (LCD)

[3] Source: Hong Kong Labour Department, Annual Department Report, 1974 - 75 p. 75.

by the manufacturers in the near future.

3.0 MARKET SEGMENTATION IN MARKETING MANAGEMENT

3.1 Market Segmentation vs Product Differentiation

According to Preston, "Marketing is the complex of activities that brings markets into being and cause them to operate", it includes "activities of potential sellers aimed at finding out what kinds of products and services potential buyers aimed at identifying their own requirements and possible ways of meeting them."[1] However, there are many ways to look at the demand of consumers. The classical theory of perfect competition assumes homogeneity of both demand and supply sides of the market, but diversity or heterogeneity have come to be the rule rather than exception. Thus under the conditions of imperfect competition, the marketing manager may design a program "to bring about the convergence of individual market demand," or "to accept divergent demand as a market characteristic and to adjust product lines and marketing strategy accordingly."[2] And the strategy of product differentiation is used to bring about convergence of demands while market segmentation strategy is designed

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[1] Lee E. Preston, Markets and Marketing, An Orientation, (Illinois: Scott, Foresman and Company, 1970) p. 5.

[2] Wendell R. Smith, "Product Differentiation and Market Segmentation as Alternative Marketing Strategies," Journal of Marketing, Vol. 21 (July 1956), p. 3-8.

for the divergency of market characteristics.

Basically product differentiation tries to shift the demand of consumers towards the seller's products by promotion. The marketing manager tries to distinguish his products from the competitors' products by heavy advertisement and promotion efforts. In the case of segmentation strategy, the marketing manager tries to develop different products for different groups/segments of markets so as to satisfy their different needs. In order words the marketing manager tries to identify and carve out segments of markets in which his products can more easily meet the needs of consumers.

A marketing manager should use the strategy of market segmentation for several reasons. First it is unrealistic to assume homogeneity in the entire market and ignore the diversity in demands. Secondly, with the use of market segmentation he can identify the unfulfilled consumers needs which provide opportunities for growth and profits. Thirdly, a segmentation outlook leads to a more precise definition of the market in terms of consumer needs. This allows him to improve his understanding of the consumers and results in his being in a better position to direct marketing programs that will satisfy these needs.

It is clear that market segmentation can provide advantages as a competitive strategy and as a guide to market planning and analysis. However, the sole use of this strategy cannot be emphasized too much. Under the present day's situation of severe competition and great diversity, the marketing manager should use both

the strategies of product differentiation and market segmentation as his tools to satisfy consumer wants at a profit. Perhaps he should have a segmentation analysis to first identify the various market segments and then use a product differentiation strategy to tackle the various segments which he wants to serve.

3.2 Bases for Market Segmentation

Segmentation can be used in a market which consists of two or more consumers. The idea of segmentation is to determine the differences among them and to group them into homogeneous groups. And for useful segments to be developed,[1] (1) the segment should be of sufficient size and market potential to warrant the expenditure of marketing funds, (2) it must be possible to reach the segment through available media, and (3) the segment should show clear variation in market behavior in comparison with other segments. With these criteria in mind, one can use a great variety of factors to segment a market and the most widely used bases are classified and evaluated below:-

(1) Socioeconomic and Demographic Variables

Socioeconomic and demographic variables are the most widely used bases for segmenting a market. Their popularity lies in the fact that they can be easily identified and measured better than other variables. However, many researchers, including

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[1] James F. Engel, Henry F. Fierille and Murray A. Cahley, eds, Market Segmentation, Concepts and Applications (New York: Holt, Rinehart and Winston, Inc., 1972) p. 7.

Frank and Massy,[1] indicate that segments obtained by such bases cannot respond differentially to marketing variables.

(2) Geographical Variables

In this approach the marketer recognizes geographic variations within his market, and the geographical units become the bases for differentiated marketing efforts. This approach has the advantage that the segments can be easily identified and accessed, but the approach gives no guarantee in the variation of marketing behavior among the various segments.

(3) Psychographic Variables

This approach tries to correlate the personality differences with the buyer behavior differences. It postulates that differences in personality will respond to different market stimuli resulting in different buyer behavior. However the results are discouraging. Frank indicates that only one percent of variation in brand loyalty for beer from one household to another is associated with personality and socioeconomic characteristics combined.[2] Moreover this approach suffers from the disadvantage that the segments obtained cannot be easily accessed.

(4) Purchasing Behavior Variables

In this case the segments are defined either in terms of a single dimension of purchasing behavior such as usage rate,

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[1] Ronald E. Frank and William F. Massy, "Market Segmentation and the Effectiveness of a Brand's Price and Dealing Policies", Journal of Business, Vol. 38 (April 1965) p. 186-200.

[2] Ronald E. Frank, "Is Brand Loyalty a Useful Basis for Market Segmentation?" Journal of Advertising Research, Vol. 7, (June 1967) pp. 27-33.

buyer motive and brand loyalty, or in terms of several dimensions of purchasing behavior. However caution must be observed in this approach. For example, usage rate is a commonly used dimension; however, one must observe that consumers often change over time from a non-potential user status to a potential user status. The best example is when women began to smoke cigarettes.

(5) Perceptual Variables

Perceptual variables are also known as the benefit segmentation or product segmentation.[1] It attempts to classify the market in terms of differences in attitudes toward product attributes or benefits. Blattberg and Sen[2] criticize this approach in that "it is not based on actual behavior, one can nexer be sure that attitudes will translate into behavior in the manner predicted by the analysis."

Of course, the above mentioned segmentation variables are not exhaustive. According to Kotler,[3] industrial markets are usually segmented on such bases as customer size, location, industrial classification, and usage rate while consumer markets are usually segmented on such bases as income, age, and family size. However, he stresses one point that not all segmentation variables are appropriate for every market and it is the firm's task to discover

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[1] Woman L. Bamett, "Beyond Market Segmentation", Harvard Business Review, Vol. 47 (Jan-Feb 1969) p. 152-166.

[2] Robert C. Blattbery and Subrata K. Sen, "Market Segmentation Using Models of Multidimensional Purchasing Behavior", Journal of Marketing, Vol. 38 (October 1974) p. 17-28.

[3] Philip Kotler, Marketing Management, Analysis, Planning and Control (New Jersey: Prentice-Hall Inc., 1969) p. 47.

which ones make the most sense in each case.[1] Thus the final selection will be the responsibility of the particular researcher who should use his imagination. With a well applied imagination, he will always uncover profitable market segments that might otherwise have been overlooked. In the next section we will discuss the significance of segmentation bases in marketing management.

3.3 The Significance of the Segmentation Bases in Market Segmentation

The sole purpose of market segmentation, as mentioned in section 3.1, is to segment the market into groups with maximum within - group homogeneity and maximum between - group heterogeneity, so that members of the same group will respond similarly to the same market stimuli. Many researchers have tried different approaches, for different products in different markets. However, the findings suggest no single approach is ideally suited for all purposes. Frank concluded,[2] "Clearly there is a need for more research if we are to gain sufficient understanding of the determinants of customer purchasing behavior in order to design more effective programs based on market segmentation."

From this we can understand that market segmentation analysis will never be fruitful without a suitable segmentation base to begin with. Using a well applied segmentation base one can easily identify the untapped market segments. A typical example

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[1] Ibid., p. 55.

[2] Ronald E. Frank, "Market Segmentation Research: Findings and Implications," in James F. Engel, Henry F. Fiorillo and Murray A. Cayley, eds., Ibid., p. 132-157.

is the introduction of Timex. Before Timex was introduced the watch companies concentrated on one segment of the U.S. market - the market that bought a watch only as a gift on important occasions - leaving the rest of the market open to attack and exploitation. The U.S. Timex Company took the attack and introduced the low priced product Timex. This success can only be achieved by careful segmentation analysis with a suitable segmentation base which in this case are the product attributes.

In the next section we are going to discuss the applicability of the market segmentation concept to the electronic calculator markets in Hong Kong.

3.4 The Applicability of the Market Segmentation Strategy to the Electronic Calculator Markets in Hong Kong

There are basically three strategies in market segmentation, which are undifferentiated, differentiated and concentrated marketing.[1] In undifferentiated marketing the firm designs separate products and marketing programs for each segment. In concentrated marketing the firm concentrates all its efforts in one or a few lucrative segments of the market. All these three strategies are being practised by the local calculator manufacturers to a certain extent. However, no apparant parrallel practise is observed for the retailers.

Some small calculator manufacturers, due to their limited resources, practise undifferentiated marketing strategy in which

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[1] Philip Kotler, Ibid., p. 57.

they to produce a single model for every customer. Some larger manufacturers and importers use a differentiated marketing strategy. With different calculator models they try to aim at different groups of target customers with different marketing programs. For example, some give a quantity discount for group buying from the students. Several firms, mainly the importers, use a concentrated marketing strategy. With limited resources, e.g. importing only one brand of calculator, they try to get a larger share of certain segments instead of a small share of the entire market. Schmidt & Co., Ltd., which is the sole agent for the famous calculator brand - Hewlett-Parkard, tries to aim at people who are not concerned with economy but only quality.

This concept is not well received by the retailers. It is believed that few retailers actually realize the concept of market segmentation. It is, perhaps, that the retailers have no choice. They have to carry all brands available so as to satisfy all the customers, otherwise customers will go to the next door competitors. It can be concluded that manufacturers do recognize the importance of this concept while retailers still do not aware of such concept.

4.0 METHODOLOGY

In this chapter we are going to discuss the methodology used for the present study. The next section is a description of the technique of analysis. Section 4.3 describes the method of collecting data and sampling design. Section 4.4 discusses the process of formulating the questionnaire. The last section discusses the limitations in the present study.

Before going to the next section we are now going to define some of the terms used in the analysis of data. A user of a particular calculator brand is defined as one who possesses and has used the calculator brand, while a non-user or a potential user of a particular calculator brand is the one who has used calculator before but not necessarily the mentioned brand. In this study we shall exclude those who have never used a calculator. Due to the small number of wholesalers and sole agents, we shall group all the firms other than manufacturers together. Thus, a retailer in this study is defined as the firms other than manufacturers.

4.1 Techniques of Analysis

The main techniques used in this survey are marginal tabulations and cross-tabulations. In the use of the semantic differential the mean ratings are plotted to obtain a semantic differential pattern.

Marginal tabulation and corss-tabulation are perhaps the most widely used techniques of analysing data in marketing research. In marginal tabulation, or frequency distribution, the number of answers in one category of a variable are counted and the percentage is computed. In this way the researcher will clearly know the distribution of one variable. Sometimes the researcher may want to know whether the answers to one question are related to the answers of another question. For example, he may wish to tell how age is related to the usage of a certain calculator brand. By cross-tabulation of these two variables one can readily know the relationship between these two.

In the analysis of the semantic differentials, the mean rating of each scale for each concept is plotted. For example, the calculator brand sharp, is rated on five different scales, namely feature, style, price, brand familiarity and quality. The means for each scale are then obtained and plotted in a scale format. To compare two profiles of scores, a quantitative measure of similarity of meaning can be made by using the generalized distance formula of solid geometry suggested by Osgood and his associates.[1] The formula is:

$$Dil = \sqrt{\sum_j d_{il}^2} \qquad (1)$$

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[1] Charles E. Osgood, George J. Suci and Percy H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957), p. 91.

where Dil is the linear distance between the points in the semantic space representing concepts i and l and dil is the algebraic difference between the coordinates of i and l on the same dimension or factor, j. Summation is over the k dimensions, which in the above example is equal to five. By using formula (1), the distances between each concept and every other concept can be calculated and entered into a matrix. This matrix represents the semantic structure of the set of concepts, giving the distances or similarity relations among all concepts.

Unfortunately, the distribution of D is not known, it is felt, however, that it is probably not normal. This may signify that perhaps the best we can do is to make some subjective or impressionistic and descriptive appraisals.

In the analysis of the importance of the product attributes of a calculator, the respondents are asked to mention three reasons for buying a calculator in order of preference. A value of three points is assigned to the first reason, a value of two points is asigned to the second one while a value of one point is asigned to the third one. A summation of all the respondents will then give the score of a particular reason. By comparing the scores of the attributes a ranking list is then obtained.

4.2 Collection of Data and Sampling Design

Collection of data

The present study uses mailed questionnaires as the data collection method. It is felt that the studied subjects, the university students and the retailers, can understand clearly the

questions asked and answer them properly. However, the data on manufacturers are collected by personal interviews. The reason behind this is that the interviews on the manufacturers acts as a pretest of the questionnaire for the retailers, and also during the personal interviews the author can discuss other things with the interviewee besides answering the questionnaire so as to get a feel about the problem. A total of seven firms were interviewed out of the twenty-seven listed in Appendix A, i.e. 26 percent of the total population.

Sampling design

(A) Retailer

The mailing list is generated from the Yellow Pages of the Telephone Directory giving a total number of 1,175 firms. Simple random sampling is used to get a sample from this list. In estimating the sample size the following assumptions are made:

(i) The proportions of the firms carrying calculator lines is about 50 per cent.

(ii) The desired confidence interval is 95%.

(iii) The level of significance is 0.05.

Thus by the formula:

$$N_0 = \frac{pq}{\sqrt{2}}$$

$$\sqrt{Z} = 0.05$$

where No : sample size

p : estimated proportion of firms carrying calculator line = 0.5

z : standardize normal variable = 1.96

σ : standard deviation

we have :

$$N_0 = \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2}$$

$$= 384$$

Since the sample size exceeds 5 percent of the population, we modify the sample size using the following formula:

$$N_1 = \frac{N_0}{1 + \frac{No}{N}}$$

$$= \frac{384}{1 + \frac{384}{1,175}}$$

$$= 290$$

In this survey the number of mailed questionnaire sent out is 346. The total returned questionnire is 15 giving a response rate of 6%. Due to the low response rate a random sample of 46 firms are selected for personal interviews. And the number of successful interviews is eleven giving a total response of 24.

(b) Consumer

Due to time and money constraints the total number of questionnaires sent out to the students is estimated to be 400. This total sample is broken down into five strata each having a size in proportion to the stratum size. The five strata include those students from the faculties of Arts, Business Administration, Science, Social Sciences and Engineering & Architecture. Table 4.1 shows the size of each stratum and Table 4.2 shows the questionnaires sent out and the actual sample obtained.

TABLE 4.1

BREAKDOWN OF STUDENTS BY FIELD OF STUDY
AT MARCH 31, 1975

Field of Study	Hong Kong University	Chinese University of Hong Kong	Sub-total
Arts	734	820	1554
Business Administration	-	479	479
Engineering & Architecture	726	-	726
Sciences	449	906	1355
Social Sciences	656	913	1569
Total	2565	3118	5683

Source: Hong Kong Education Department, Annual Summary, 1974-75, Education Department, p. 55 and p. 58-59.

TABLE 4.2

STATISTICS OF SAMPLING FRAME

Field of Study	Questionnaires Sent Out		Sub-total
	Hong Kong University	Chinese University of Hong Kong	
Arts	21 (2)	36 (5)	57 (7)
Business Administration	-	57 (24)	57 (24)
Engineering & Architecture	61 (20)	-	61 (20)
Science	36 (13)	43 (12)	79 (25)
Social Sciences	46 (12)	47 (12)	93 (24)
Total	164 (47)	183 (53)	346 (100)

* Note: Figures in brackets show the number of returned questionnaires, the last one of which has been dropped for the sake of convenience.

4.3 Questionnaire Design

In the design of the questionnaires the two overriding considerations are:

(1) the objectives of the research project, which in this case is the perception of the calculators by the retailers and potential users of the university students, and

(2) the respondent's point of view.

In order to get the respondent's point of view two focus group discussions were held, each group consisted of five students. The group members were asked to express freely their views on the calculators in any respects. A summary of findings is given in Appendix B.

Since the method of collection of data is mailed questionnaire, the questions will be structured, closed-end type of questions. The first part of the questionnaire for the retailers is the general aspects of the marketing of calculators, the second part is the semantic differential scaling on the selected calculator brands which are the most favorable brands suggested by the manufacturers during the pretest of the questionnaire. The third part is the rating of the segmentation variables and the last part is the classification data of retailers. The first draft of the questionnaire is pretested by making personal interviews on the manufacturers. After the pretesting, the set of semantic differential scaling on calculators is added into the questionnaire. The final questionnaires are mailed to the retailers together with a covering letter[1] written in both

[1] The questionnaire are the covering letter are attached in Appendix C.

English and Chinese.

After the collection of data on the retailers, the questionnaires for the students were mailed. This questionnaire is constructed along the same lines as that for the retailer. The first part is the usage pattern and the buying pattern. The second part is the semantic differential scaling on the calculators and the last section is the demographics of the respondents. Due to the low response rate of the retailers, the semantic differential scalings on the calculators are reduced to five calculator brands including Cannon, Casio, Colex, Fords and Realtone. Sharp and Sanyo are dropped because it is felt that:-

(1) the present student market is dominated by these two brands;

(2) due to competition fewer students will buy these two brands in the future; and

(3) the semantic differential is mainly used to get the perception of the potential buyers or non-users.

The questionnaire is pretested by personal interviews on seven students randomly selected in a library. The pretesting is mainly used to get the questions clearly worded and any possible answers which are not listed in the questionnaire. The final draft of the questionnaire together with a covering letter[1] is mailed to the students. A total of 347 sets of questionnaires were mailed and there were 101 returned questionnaires giving a response rate of 27 percent. The last returned questionnaire was dropped out for the sake of convenience.

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[1] The questionnaire and covering letter are attached in Appendix C.

4.4 Limitations

There are many limitations in the study, among which time and money are the major ones. The time available for this study is only about four months and there are limited funds available for the research. Other major limitations derived from the methodology include the following:-

(1) Sampling Error

In the study of the students the sample size is derived from stratified random sampling with proportional allocation among the fields of studies. However, when we compare the statistics shown in Tables 4.1 and 4.2 it is evident that there is sampling error and bias. The total number of Arts students of the two universities constitutes 27 percent of the students while the sample has only 16 percent of Arts students. However it is expected that the usage rate of Arts students is low so that the resultant sample does represent the portion of the students who are potential buyers of calculators.

(2) Non-response Error

The low response rate in the case of retailers indicates there is certain error either in the sampling frame or the questionnaires. Also there is low response rate for the Arts students and this introduces non-response error.

5.0 ANALYSIS OF DATA ON RETAILERS AND MANUFACTURERS

The analysis of data is divided into two chapters. The present chapter is the anlaysis of data of the retailers and manufacturers while the next chapter is the analysis of the consumer data. The first section of the chapter describes the demographics and other background data of the respondents. The second section tries to analyse the perception of calculator brands by retailers and manufacturers. The section consists of the semantic differential patterns of selected brands of calculators, the analysis of the five most salable brands of calculators and the analysis of the marketing of calculators. The last section is the analysis of the segmentation bases of manufacturers and retailers. It consists of a comparison of the importance of the various bases between the two. Now let us discuss the demographics of the respondents in the next section.

5.1 Demographics and Other Background Data of Retailers and Manufacturers

Demographic and other background data of retailers

Five questions are asked in attempt to measure the size, the types and age of the companies.

(i) Types of company (Table D-1) - of the twenty-four respondents three are sole agents, two are wholesalers and the remaining seventy are retailers. Two of the firms classify themselves

as others.

(ii) Age (Table D-2) - About 46 percent of the firms have been operating for a period of over five years. 25 percent of them are over four years old.

(iii) Size - Over 50 percent of the firms employ a work force of less than 10 persons and only 20.8 percent of firms have a total work force of 11 to 20. There is only one firm that employs over 100 employees. Table D-3 shows the distribution of size of companies.

(iv) Number of calculator models on sale - Nearly all the companies (95.8%) sell less than 30 models of calculators. Table D-4 shows the exact figure.

(v) Annual sales (Table D-5) - All the firms have an annual sales volume over HK$500,000 with 50 percent of them selling over HK$1,000,000 per annum.

Demographics and other background data of manufacturers

(i) Age (Table D-6) - Over 50 percent of the manufacturers are less than three years old. The remaining firms are over 4 years old.

(ii) Size - Two out of the seven firms employ a work force between 100 men, while the others have a work force over 100 men.

(iii) Number of calculator models on sale (Table D-7) - All the firms manufacture less than 20 calculator models, 42.9 percent of which manufacture less than 10 calculator models.

(iv) Annual Sales (Table D-8) - Over 85 per cent of the firms have an annual sales figure of over HK$1,000,000 while the remaining

15 percent indicate an annual sales figure in the range of HK$50,000 and HK$150,000.

5.2 Analysis of Perception on Calculator Brands by Retailers

Analysis of semantic differential patterns of selected brands of calculators

Seven brands of calculators are rated on five attributes by the retailers. The seven brands include Cannon, Casio, Colex, Fords, Realtone, Sanyo and Sharp; while the five attributes are brand image, body style, quality, price and feature. Figure 6.10 - 6.16 shows the various semantic differential patterns.

(i) Cannon - It is perceived as quite expensive but relatively high quality product. The body style is somewhat modern and the features are just sufficient. The calculator is quite well known.

(ii) Casio - It is quite inexpensive but the quality is relatively high. The style is somewhat modern and the features are adequate. The calculator is not very well known.

(iii) Colex - It is a cheap product with low quality. The style is somewhat old fashioned and the features are adequate. However, the calculator is a well known brand.

(iv) Fords - It is cheap with somewhat low quality. The style is somewhat old fashioned and the features are not quite adequate. Also this brand is not well known.

(v) Realtone - The calculator is relatively expensive but is a relatively high quality product. The style is somewhat

modern and it carries adequate features. The brand is quite well known.

(vi) Sharp - The calculator is somewhat expensive but the quality is quite good. It has a modern-styled body design and carries sufficient features. It is a well known calculator brand.

(vii) Sanyo - The calculator is somewhat of a high priced product with quite high quality. The body is somewhat modern styled and the features are somewhat sufficient. It is a very well known calculator brand.

Analysis of the five most salable brands of calculators

(A) Five most salable brands - According to the frequency distribution of the brands which are classified as the five most salable brands by the retailers, the five brands of calculator are Sharp, Sanyo, National, Colex, and Casio.

However, the manufacturers have different opinions. The five most salable brands, in order, are Sharp, Casio, Sanyo, Colex and either Fords, General, Cannon or Realtone. Table 5.1 shows the frequency distribution of the five brands rated by retailers and manufacturers.

TABLE 5.1

FREQUENCY DISTRIBUTION OF FIVE
MOST SALABLE CALCULATOR BRANDS

Ranking	Manufacturer		Retailer	
	Brand	Frequency	Brand	Frequency
1	Sharp	6	Sharp	22
2	Casio	6	Sanyo	17
3	Sanyo	4	National	14
4	Colex	3	Colex	12
5	Cannon/ Realtone/ General/ Fords	2	Casio	11
	Total	30	Total	114

(B) Size - All the manufacturers agree that the pocket size calculator is the most favorable size of the five most salable calculator brands. However, only 75 percent of retailers say that the pocket size is the favorable size and 20.8 percent of them indicate that desk-top size is the favorable size. The remaining 4.2 per cent regarded the hand-held size as being the favorable size.

(C) Reasons for high sales - According to a similar method of analysis as in the case of consumer, the ranking of the reasons for such high sales by retailers and manufacturers are displayed in Table 5.2.

TABLE 5.2

RANKING OF REASONS OF HIGH SALES
BY RETAILERS AND MANUFACTURERS

Ranking	Reasons	
	Retailer	Manufacturer
1	Low Price	Low Price
2	Brand Image	High Quality
3	Modern Style	Good Feature
4	Good Feature	Modern Style
5	Size	Brand Image

From Table 5.2 we can see that competitive price is the most vital attributes of a calculator in both cases of retailers and manufacturers. However, the manufacturers rank quality as second and the retailers rank brand image as second. Style is ranked third by retailers but good feature is ranked as third by manufacturers. The fourth and fifth reasons are good feature and adequate size in the case of retailer while the corresponding reasons are style and brand image in the case of manufacturers.

Analysis of the marketing of calculators of retailers and manufacturers

(i) Distribution - The firms interviewed are Business Electronics Ltd., Colex Ltd., Fords Electronics Ltd., Realtone Ltd., Sonca Industries Ltd. and Tabulex Ltd.

The brands that are available in the retailers are shown in the following table.

TABLE 5.3

CALCULATOR BRANDS ON SALE AT RETAILERS

Brands	Frequency	Brands	Frequency	Brands	Frequency
Sanyo	15	Silver Reed	8	Royal	3
Casio	15	Realtone	7	Fords	3
National	14	Adlar	7	Aristo	2
Sharp	14	Compex	7	Others	18
Cannon	11	Ricomac	6		
Colex	11	Santonic	6		
Crown	9	Standard	6		
General	9	Omron	5		
Kolvac	9	Alfa	4		
		Monroe	4		

From the above table both Sanyo and Casio has the widest distribution (62.5 percent of retail outlet). National and Sharp are the second widest distributed brand (58.3 percent). The third widest distributed brand is Cannon and Colex which have eleven retail outlets in this particular sample, i.e. 45.8 percent.

(ii) Source of Supply - Many firms have many sources of supply. About 30 percent of the firms have their supply from the manufacturers, while over 90 percent of them get the supply from the importers and 75 percent from the wholesalers.

(iii) Types of Customers - The interviewed manufacturers report a wide range of answers. Three firms indicate that they are export-oriented, and they all have overseas sales over 60

percent through either exporters or direct shipment. One firm reports that its product is entirely manufactured for another manufacturer under private label. The remaining three firms say their products are distributed through wholesalers, retailers and even to the consumers directly. Table 5.4 shows the percentage of customers of the seven respondents.

TABLE 5.4

DISTRIBUTION OF CUSTOMERS OF SEVEN ELECTRONIC CALCULATOR MANUFACTURERS

Customer	1	2	3	4	5	6	7	Average Percentage
Retailer	30%	3%	-	-	5%	-	-	6
Wholesaler	70%	3%	100%	5%	5%	-	-	26
Consumer	-	2%	-	-	30%	-	-	5
Business Concern	-	2%	-	-	-	-	-	0
Exporter	-	20%	-	10%	60%	-	10%	14
Others	-	70%	-	85%	-	100%	90%	49

Note: Others include direct shipment and other manufacturers

In the case of retailers/wholesalers, the distribution is shown in Table 5.5. Their customers are the individual consumers, comprising 65% of their total sales. However, their customers also include other retailer, wholesaler, exporter and business firms.

TABLE 5.5

DISTRIBUTION OF CUSTOMERS OF RETAILERS/WHOLESALERS

Type of Customers	Percentage
Retailers	16
Wholesaler	4
Exporter	3
Business Concern	6
Individual Customer	65
Others	6
Total	100 (24)

(iv) Types of consumers - Table 5.6 shows the mean of the manufacturers' estimates of the various types of customers. The markets are divided into four major groups namely business executives, marketing and sales people, secondary students and post-secondary students. The minor markets are the professionals and office users. The student market consists of nearly 30 percent of the total market while the commercial market (business executives and marketing people) consists of about 45 percent. The retailers estimate that the student market only consists of 19 percent while the commercial market consists of over 60 percent.

TABLE 5.6

DISTRIBUTION OF CONSUMERS ESTIMATED
BY MANUFACTURERS AND RETAILERS

Customer	Mean Percentage	
	Manufacturer	Retailer
Business Executive	19	23
Marketing & Sales People	35	38
Secondary Students	14	6
Post-Secondary Students	15	12
Professionals	5	8
Others	9	10
Total	100 (7)	100 (24)

(v) Terms of Payment - Over 90 percent of manufacturers use letter of credit as their terms of payment given to their buyers. However, 29 percent of the respondents also use cash on delivery and ASAP delivery as terms of payment in local sales. Over 85 percent of the retailers buy the calculators by cash but they also have bought products using 21 to 45 days of credit terms from their supplies.

(vi) Target Market - All of the manufacturers report that they have target customers and they design different models for different markets. The target markets cited are educated people, professionals, students and commercial markets.

Only 29 percent of the retailers indicate that they aim at a certain target group and only one mentions that his target groups are sales people and students.

5.3 Analysis of the Segmentation Bases of Manufacturers and Retailers

Analysis of segmentation bases of manufacturers

(i) Socioeconomic and Demographic Variables

A total score of 31.72 points are obtained from the manufacturers with an average rating of 2.88 points on each variable. This indicates that the manufacturers do not emphasize the socioeconomic and demographic variables. However, the manufacturers do rate some of the variables very high and the variables include age (4.14), occupation (4.00), education (4.29), income (3.71) and region (3.43). Education is rated as the most important variable since the manufacturers believe that a person who uses a calculator should at least have a secondary education. As a result, they can divide the market of users and non-users according to education level.

Another important variable is age. This is due to the fact that older people in Hong Kong rely on Chinese abacuses and do not use calculators. Thus, age is a useful variable in segmenting the market.

Occupation is also considered to be quite important since certain occupations do not require calculations. Different occupations, however, require different models. Table 5.7 shows

the rating of the various variables.

(ii) Product Attributes

The cumulative rating score for this set of variables is 50.57 giving an average rating of 3.89 for each items. In contrast, the rating of the demographic and socioeconomic variables is only 2.88. This indicates that the product attributes are much more important than the demographic and socioeconomic variables in segmenting the calculator markets.

The five highest rating variables are feature (4.57), quality (4.14), size (4.14), brand image (4.14) and display (4.43). It is expected that the manufacturers will produce different models with different features to cater to the needs of different markets. The scientific model is designed for people with engineering and science backgrounds. The financial model is made for commercial and business people. Quality is also considered as a critical factor. The manufacturers use quality to segment the market. Perhaps they use good quality with a relative high price to suit the quality-conscious people and moderately good quality with low price to suit the economy-conscious people. The manufacturers also believe that display plays an important role. They use different types of displays to suit different tastes of people. Table 5.7 shows the rating of the variables.

Analysis of segmentation bases of retailers

(i) Socioeconomic and Demographic Variables

The cumulative rating score of the retailers for this set is 30 giving an average rating of 2.73 for each variable.

When compared to the average rating or manufacturers (2.88) we can see that the retailers put even less emphasis on the demographic and socioeconomic variables in segmenting the market. The high rating variables include income (3.90), occupation (4.05) and education (3.75); age and region have only a rating of 2.95 and 2.50 respectively. Perhaps such low rating on age and region is accounted for by the strategy of the retailer. Typically, every retailer will welcome all consumers without regard to age. Their strategy is to sell as much as possible with the existing stock of calculators. Also, once the retailers locate their shop in a certain district then the regional factor will become indifferent to them.

(ii) Product Attributes

The total score for this set of variables is 46.02 giving an average score for each variable of 3.54. This indicates that the retailers put much emphasis on this set of variables as opposed to the demographic and socioeconomic variables. The important attributes include display (4.14), price (4.48), quality (4.43), feature (4.10) and body design (3.98). The retailer will stock his inventory according to these various factors to meet the needs of the customers. Table 5.7 shows the rating for each of the variables by retailers and manufacturers.

TABLE 5.7

RATING OF SEGMENTATION VARIABLES
BY MANUFACTURERS AND RETAILERS

Variables	Retailer	Manufac-turer	Variables	Retailer	Manufac-turer
Region	2.50	3.43	Price	4.48	4.00
Population Density	2.55	2.71	Quality	4.43	4.14
Age	2.95	4.14	Brand Image	3.67	4.14
Sex	1.90	1.86	Size	3.00	4.14
Family Size	1.95	2.00	Weight	2.43	3.43
Family Cycle	2.40	2.29	Easy Operation	3.62	3.86
Income	3.90	3.71	Feature	4.10	4.57
Occupation	4.05	4.00	Body Design	3.95	4.00
Education	3.75	4.29	Maintenance	3.05	4.00
Region	1.90	1.00	Additional Accessory	2.48	2.71
Social Class	2.15	2.29	Energy	2.87	3.29
			Keyboard	3.86	3.86
			Display	4.14	4.43

6.0 ANALYSIS OF DATA ON CONSUMERS

This chapter focuses on the analysis of consumer data and the comparison of the perception on different brands of calculators among the users, the non-users and the retailers. The first section displays the demographics and other background data of the respondents of consumers. The demographic and socioeconomic variables include field of study, age sex, marital status, types and place of residence, monthly family income and the place of school. The second section is the analysis of perception of calculator brands by the respondents. It consists of the analysis of the importance of the attributes of calculators, the semantic differential patterns of selected calculator brands, and the buying and usage patterns. The last section compares the perceptions on calculators between consumers and retailers.

6.1 Analysis of Demographics and Other Background Data

(i) Field of Study (Table D-9) - Most of the respondents, over 90 percent, come from the faculty of business administration, engineering & architecture, science and social science. Only 7 percent come from the arts faculty.

(ii) Age - All the respondents are over nineteen years of age and 75 percent of them are between the ages of 19 to 22 years. Thus the sample is mainly composed of young people. The distribution of age of the respondents is shown in Table D-10.

(iii) Sex (Table D-11) - 72 out of 100 respondents are male respondents.

(iv) Marital Status - Over 95 percent of the respondents are single with only 3 percent being married. Table D-12 shows the distribution of marital status.

(v) Types of Residence - There is an even distribution of the types of residence among the respondents. Table D-13 shows the exact distribution.

(vi) Size of Family (Table D-14) - Over 50 percent of the respondents come from a family with 5 to 8 people. No respondent has a family of over 10 people.

(vii) Place of Residence - 54 percent of respondents live in Kowloon side, 40 percent live in Hong Kong Island while the remaining 7 percent live in Tsuen Wan. Details of the location of residence are shown in Table D-15.

(viii) Monthly Family Income (Table D-16) - Over 50 percent of respondents have an income between the range of HK$1,000 to HK$3,000. Thirteen percent of respondents have a monthly family income below HK$1,000 and 10 percent have a monthly income between HK$3,000 and HK$4,000.

(ix) Universities (Table D-17) - 47 percent of the respondents come from the University of Hong Kong while the remaining 53 percent come from the Chinese University of Hong Kong.

6.2 Analysis of Perception on Calculator Brands by Consumer

Analysis of the importance of the attributes of calculator

(A) At the time of purchase

There are quite a number of reasons, reported in question 8, for buying a calculator. However, there are only eight factors that are frequently reported. These factors include price, features, design/style, easy operation, quality, size, power source and brand familiarity. Other minor factors include attraction by advertisement, friend's introduction and shopkeepers' introduction etc.

(i) First Reason - Over 30 percent of the respondents indicate sufficient features/functions of a calculator as their first reason for buying their particular brand while 25 percent give low/reasonable price as their first reason. The following table shows the distribution of the reasons.

(ii) Second Reason - Over 41 percent of respondents report low price as their second consideration for buying, while 13 percent of which report functions and style of a calculator as their second reason. The remaining percentage is distributed quite evenly among the remaining factors.

(iii) Third Reason - In this case, 16.4 percent of respondents reports low/reasonable price of a calculator as their third consideration. However, there is 12.7 percent of the respondents who indicate suitable size of a calculator is the third reason. The following table shows the detail distribution of the three reasons.

TABLE 6.1

DISTRIBUTION OF REASONS FOR PURCHASING

Reasons	First		Second		Third	
	Number	Percentage	Number	Percentage	Number	Percentage
Sufficient Features	24	34	8	13	2	4
Low Price	18	25	25	41	9	16
Brand Image	4	6	2	3	4	7
Easy Operation	3	4	1	2	5	9
Body Style	2	3	8	13	4	7
Convenient Power Source	1	1	1	2	-	-
Size	-	-	3	5	7	13
Quality	-	-	3	5	3	6
Others	19	27	-	-	21	38
Total	71	100	61	100	55	100

From Table 6.1 we can conclude that the respondents regard price and feature as the major attributes when buying a calculator. If two calculators had the same price and features, they will then consider other minor details such as styling, brand image, power source, size and ease of operations.

We can see the picture more clearly by the following method. For each factor, we will multiply a score of three to the percentage reported as the first reason, a score of two

multiplied to the percentage reported as the second reason, a score of one multiplied to the percentage reported as the score of that particular factor. The following table shows the score of the eight factors.

TABLE 6.2

RANKING AND SCORE OF THE FACTORS

Ranking	Factor	Score
1	Price	175
2	Feature	131
3	Style	42
4	Brand Image	31
5	Easy Operation	21
6	Suitable Size	23
7	Quality	15
8	Convenient Power Source	7

From Table 6.2 it is noted that low price and sufficient features are the two major attributes in buying a calculator. The third important attribute is the body design/style of the calculator. It is quite interesting to note that quality of a calculator ranks only seventh in the above table.

(B) After Purchase

Tables 6.3 shows the percentage distribution of the various attributes that the respondents like their calculators.

Ease of operation has the highest percentage (23.1%) with sufficient features being the next factor (15.4%). Suitable size has 12.8 percent while convenient power source has 7.7 percent.

TABLE 6.3

ATTRIBUTE IMPORTANCE AFTER PURCHASE

Factors	Number	Percentage
Easy Operation	9	23
Sufficient Feature	6	15
Suitable Size	5	13
Convenient Power Source	3	8
Body Style	2	5
Low Price	2	5
Quality	1	3
Brand Image	1	3
Others	10	26
Total	39	100

Table 6.4 shows the percentage distribution of the attributes that the respondents do not like about their particular calculator. Over 34 percent report that their calculators do not have sufficient features and 17 percent report that they do not like the power source/power consumption of their calculator. It is interesting to note that some of

them complain about the operation procedure of their calculators.

TABLE 6.4

PERCENTAGE DISTRIBUTION OF ATTRIBUTES
DISLIKENESS AFTER PURCHASE

Factors	Number	Percentage
Feature	14	34
Power Source	7	17
Body Style	4	10
Quality	2	5
Price	1	2
Size	1	2
Easy Operation	-	-
Brand Image	-	-
Others	12	29

From the above two tables we can see that "Feature" is the only factor that reminds people from time to time while other factors are only significant in one time or the other. "Price" is particularly important at the time of purchase but its importance diminishes after purchase.

Analysis of the semantic differential pattern of the calculator brands

(A) Semantic Differential Pattern of calculators by users

Semantic differential patterns of nine major brands of calculators are plotted using the mean of the rating of respondents. These nine major brands of calculators include

Cannon, Colex, Casio, Fords, National, Novus, Realtone, Sanyo and Sharp. The patterns are plotted in Figure 6.1 - 6.9.

(i) Cannon - It is considered as a relatively expensive but a hard to operate calculator. It is also considered as having sufficient feature with quite a small size; however, its style is considered to be old-fashioned.

(ii) Casio - The product is relatively cheap with adequate feature and reasonably high quality. The calculator is quite small in size but the display is easily read.

(iii) Colex - The product is relatively cheap with sufficient feature and high quality. The calculator is considered to be quite small with an easily readable display.

(iv) Fords - This brand is viewed as a relatively cheap product with low quality. However, the product carries adequate feature and an easily readable display. Also it is quite compact in size and very easy to operate.

(v) National - The product is very expensive with very good body design. It is very easy to operate and carries good display. The brand is considered to be quite popular.

(vi) Novus - The respondents show no particular indication on the various attributes of this brand except quality. It is regarded as a relatively high quality product.

(vii) Realtone - It is quite expensive with relatively high quality. However, the size is quite large, energy consumption is great, features are not enough and display is hard to read.

(viii) Sanyo - The respondents show no particular indication on the various attributes except display. The display is considered to be quite easily read.

(ix) Sharp - It is quite cheap with adequate features. Quality is reasonably good and the size is small.

(B) Semantic Differential Pattern of Selected Calculator Brands

Five brands of calculators are rated on five major attributes and the semantic differential patterns are plotted in Figure 6.10 - 6.16. Table 6.5 shows the means of ratings by the respondents.

TABLE 6.5

MEAN RATING OF ATTRIBUTES OF FIVE CALCULATORS BRANDS BY NON-USERS

Brands/Attributes	Cannon	Casio	Colex	Fords	Realtone
Price	4.12	3.47	3.20	2.98	4.58
Quality	4.62	3.84	3.29	3.78	4.47
Brand Image	4.02	4.13	3.41	4.35	3.34
Style	3.21	4.95	3.86	3.98	3.26
Feature	3.65	4.16	3.54	3.72	2.98

(i) Cannon - This brand is relatively expensive, reasonably high quality, modern styled. However, the brand is not very well known.

(ii) Casio - The price together with quality is relatively low. The styling belongs to old fashion and the feature

is not adequate.

(iii) Colex - It is a low priced, low quality product. However, it is quite well known and the product carries sufficient feature.

(iv) Fords - It is a very low priced, low quality product but with adequate feature. The brand is not well known.

(v) Realtone - It is regarded to relatively expensive and higher quality. The style is modern and it carries sufficient feature. Also the brand is quite well known.

SEMANTIC DIFFERENT PATTERN OF CALCULATORS

(i) CANNON

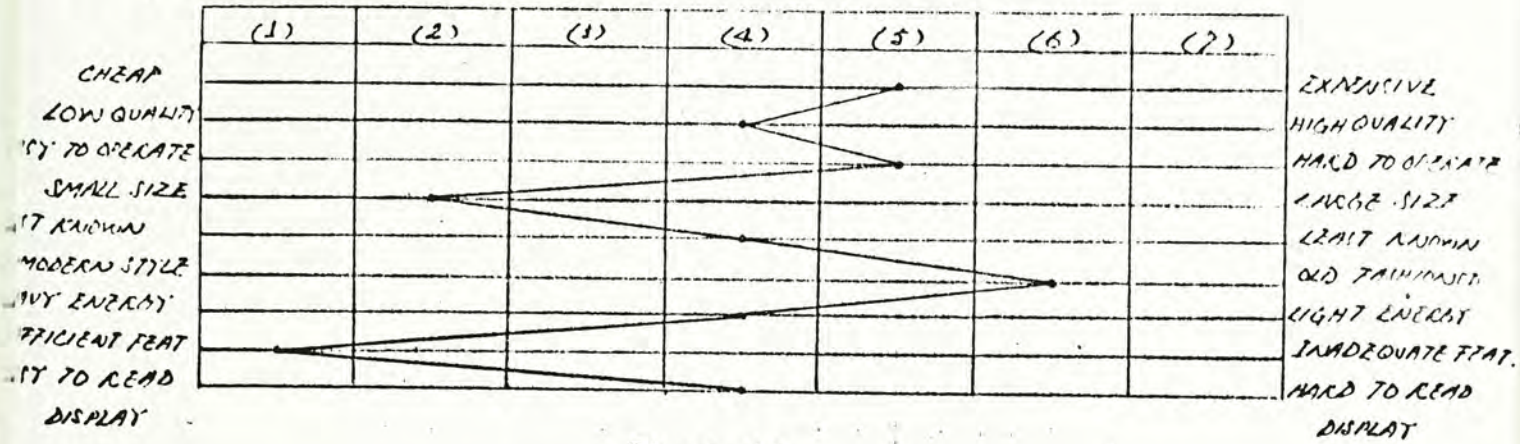

Figure 6.1

(ii) CASIO

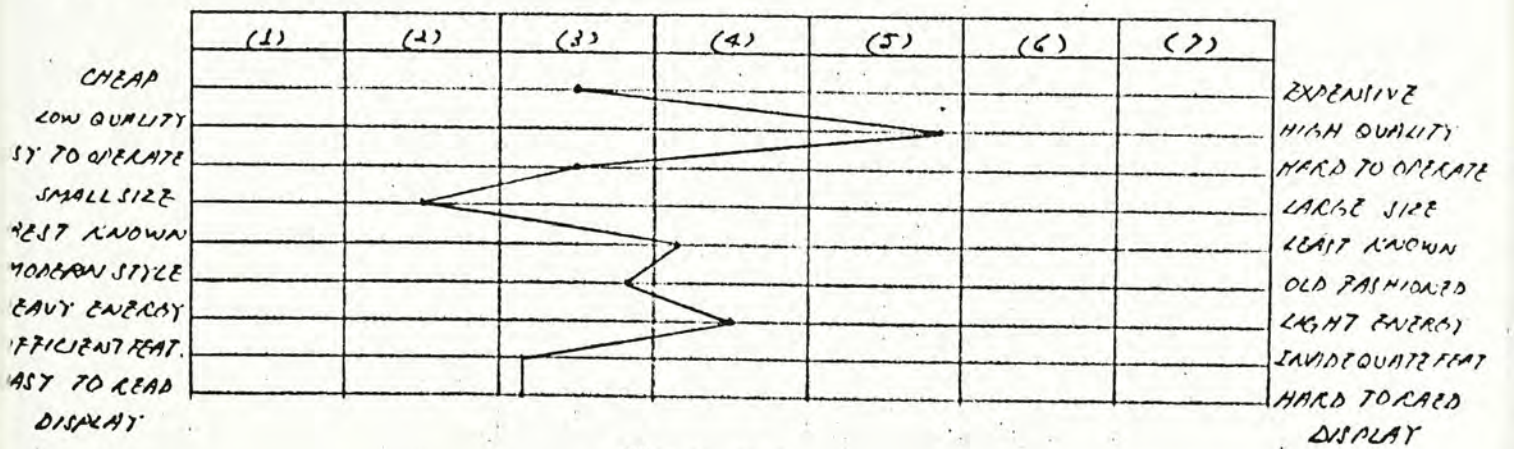

Figure 6.2

(iii) COLEX

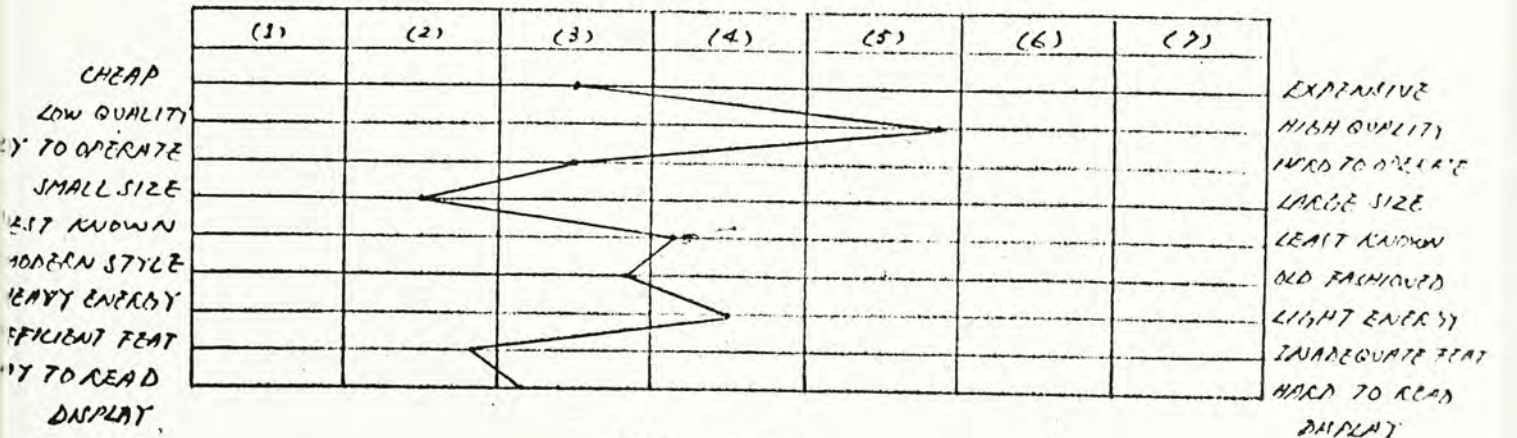

Figure 6.3

(iv) ROADS

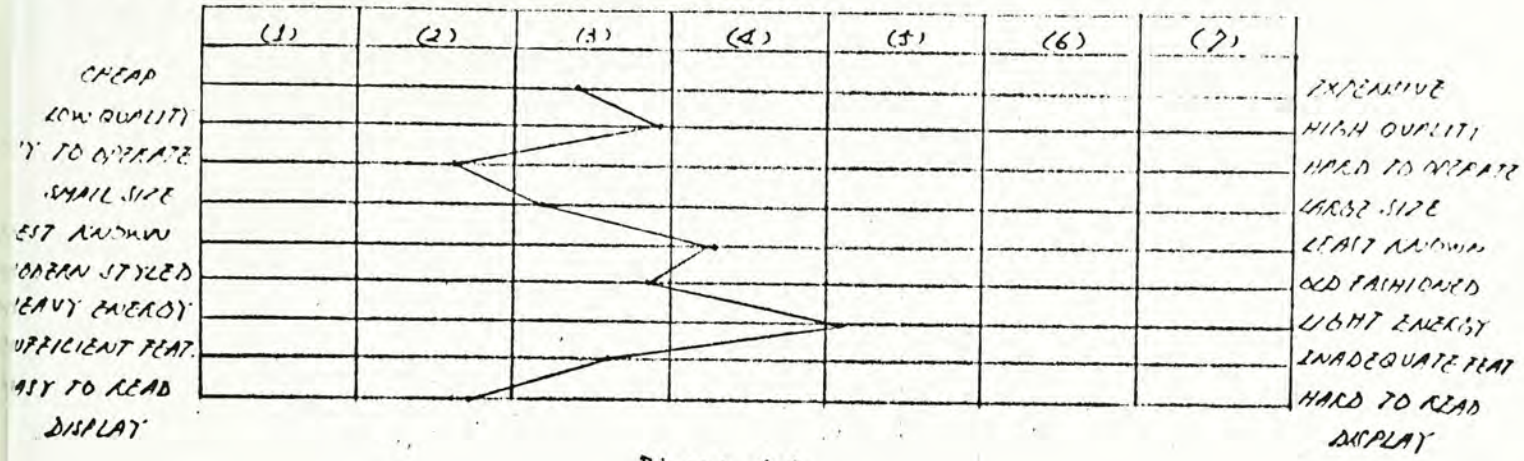

Figure 6.4

(v) NATIONAL

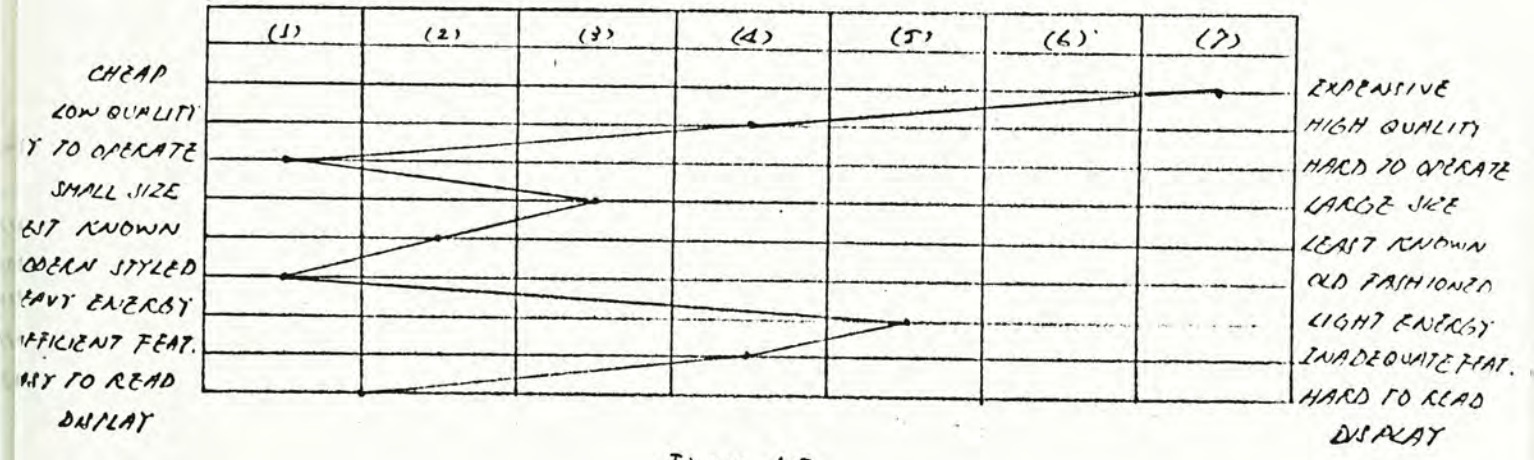

Figure 6.5

(vi) NOVUS

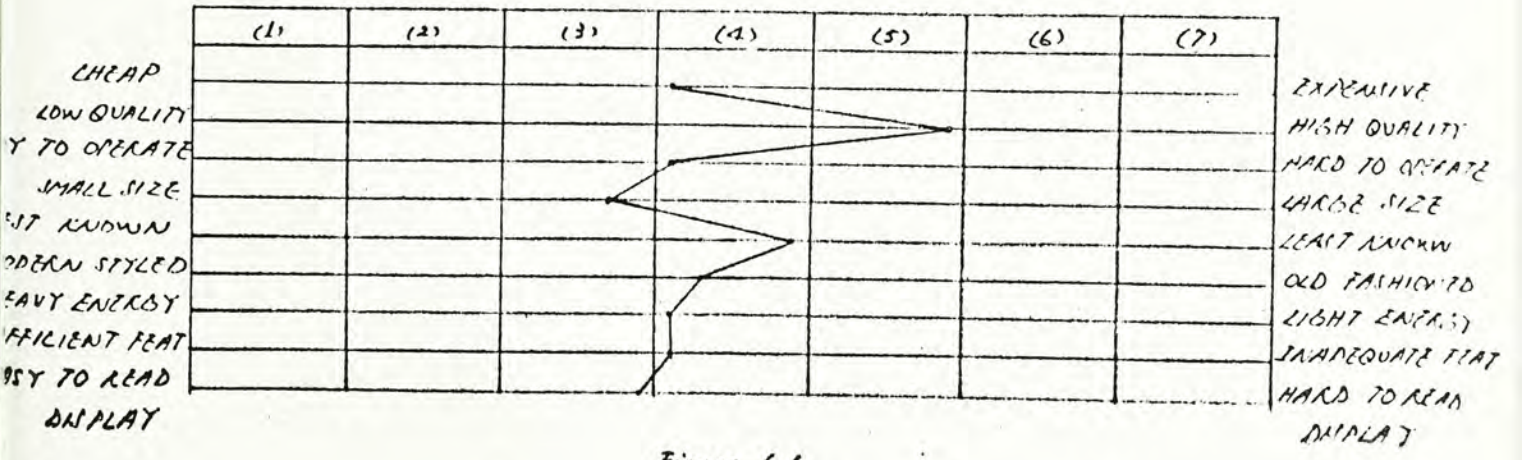

Figure 6.6

(viii) RITALTONE

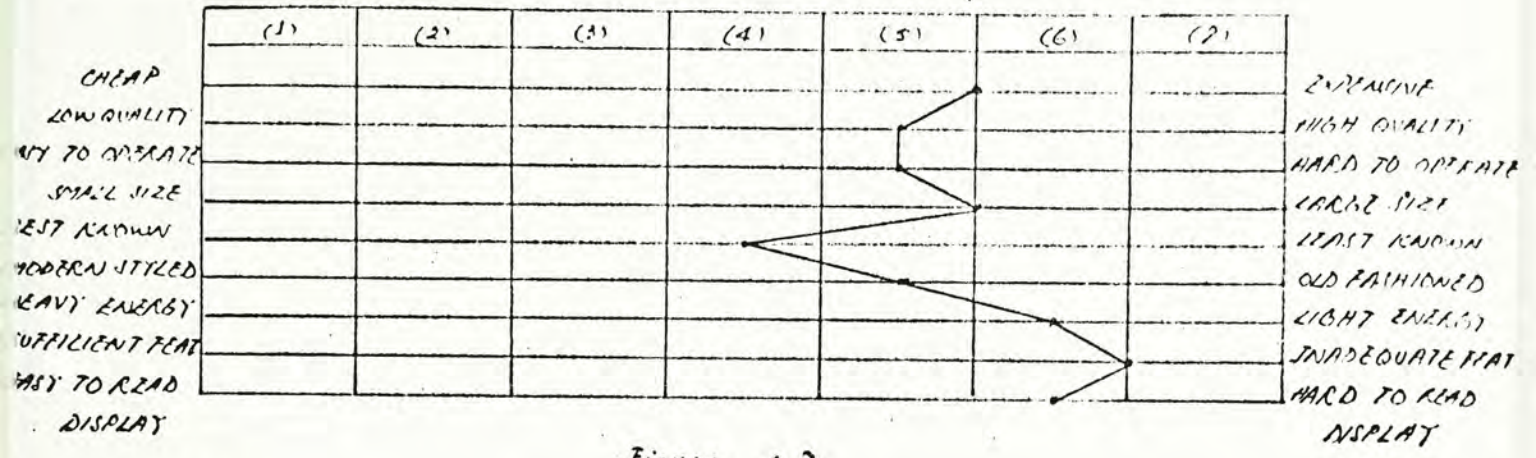

Figure 6.7

(viii) SANYO

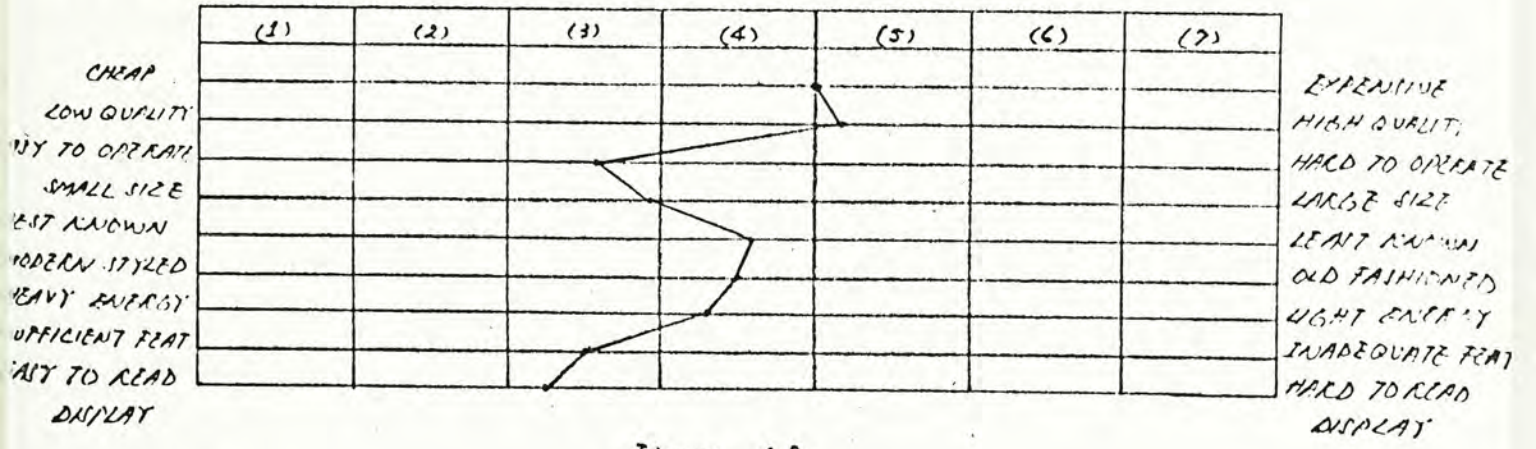

Figure 6.8

(ix) SHARP

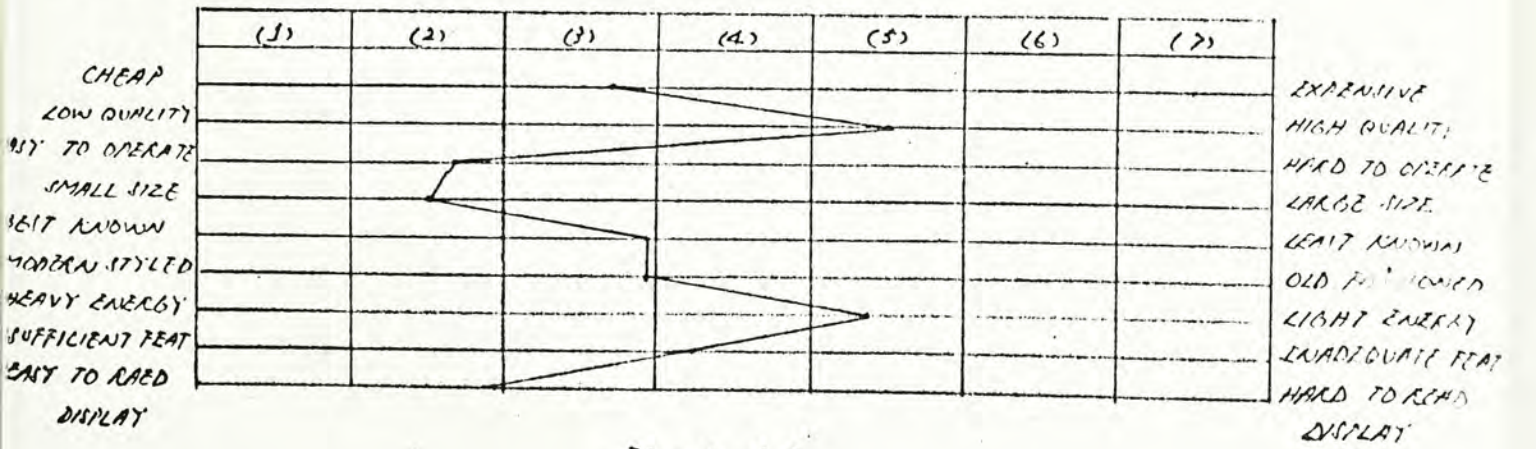

Figure 6.9

SEMANTIC DIFFERENTIAL PATTERN OF SELECTED CALCULATOR BRANDS BY USERS, NON-USERS AND RETAILERS

LEGEND : — NON-USERS
-- RETAILERS
-·- USERS

(i) CANNON

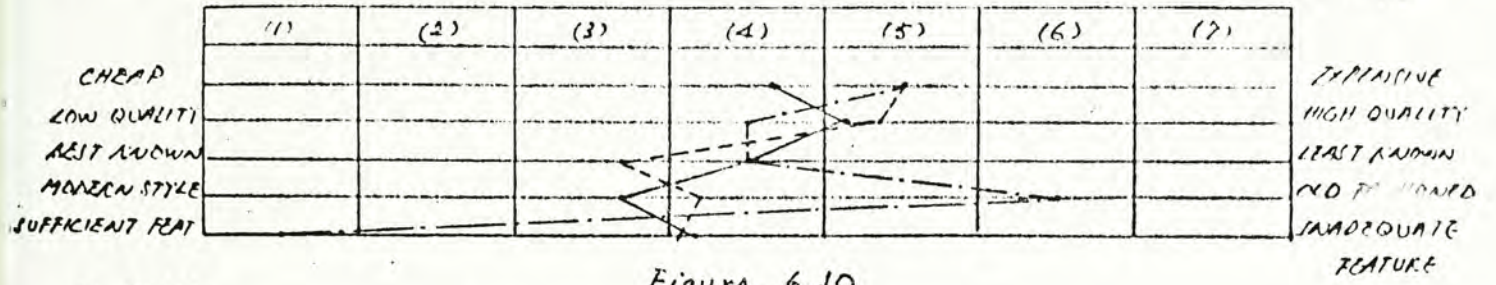

Figure 6.10

(ii) CASIO

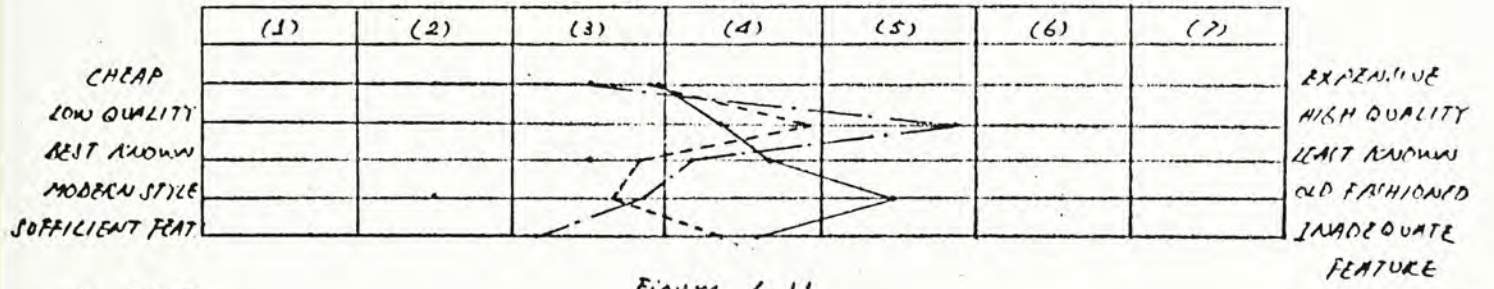

Figure 6.11

(iii) COLEX

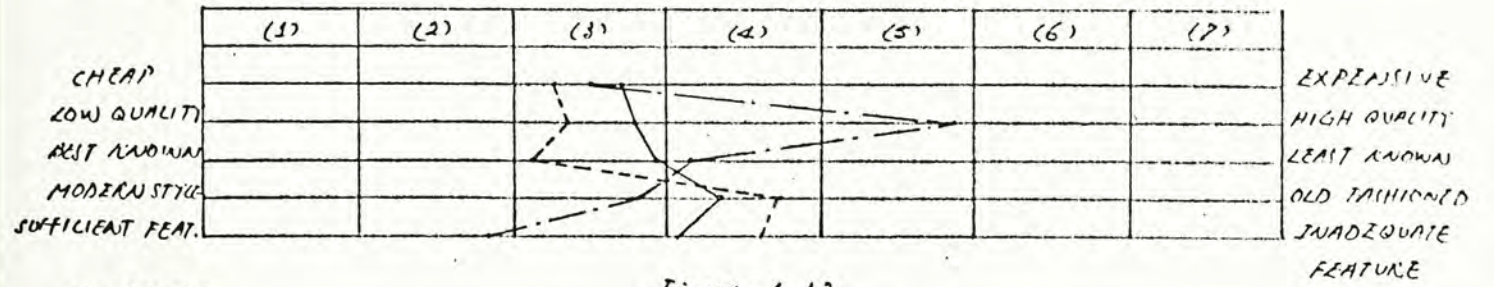

Figure 6.12

(iv) FORDS

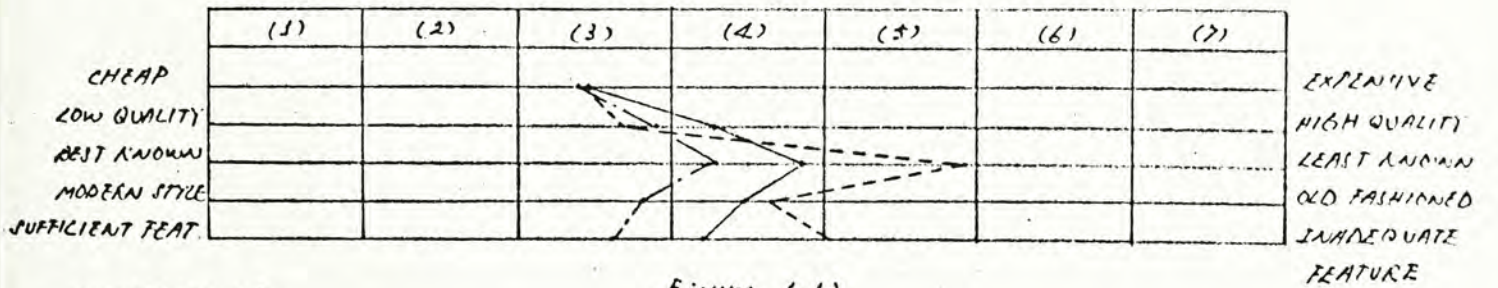

Figure 6.13

(v) REALTONE

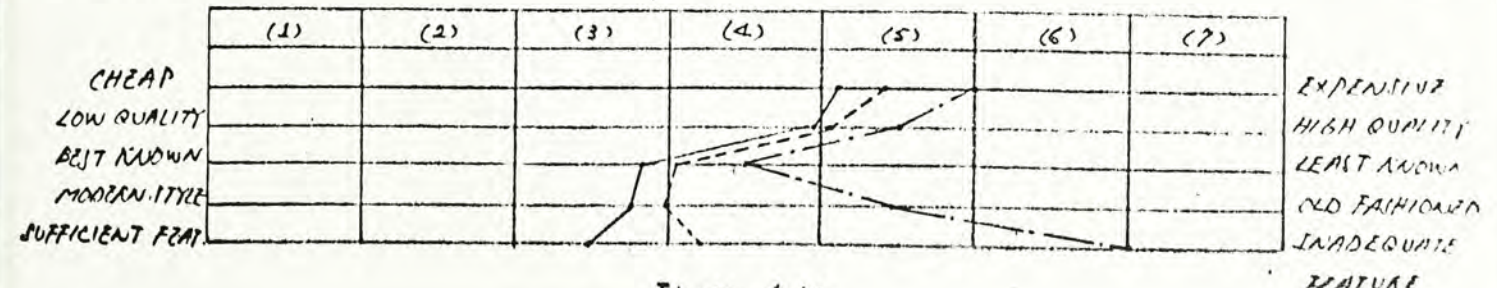

Figure 6.14

(vi) SANYO

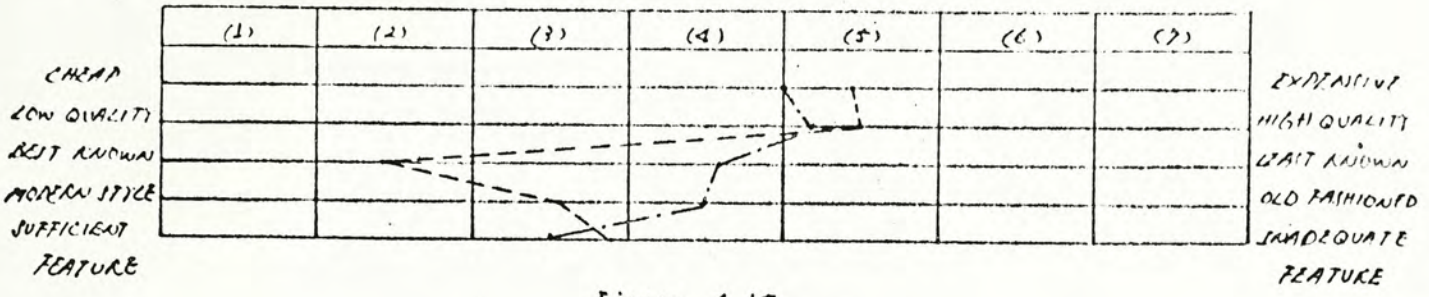

Figure 6.15

(vii) SHARP

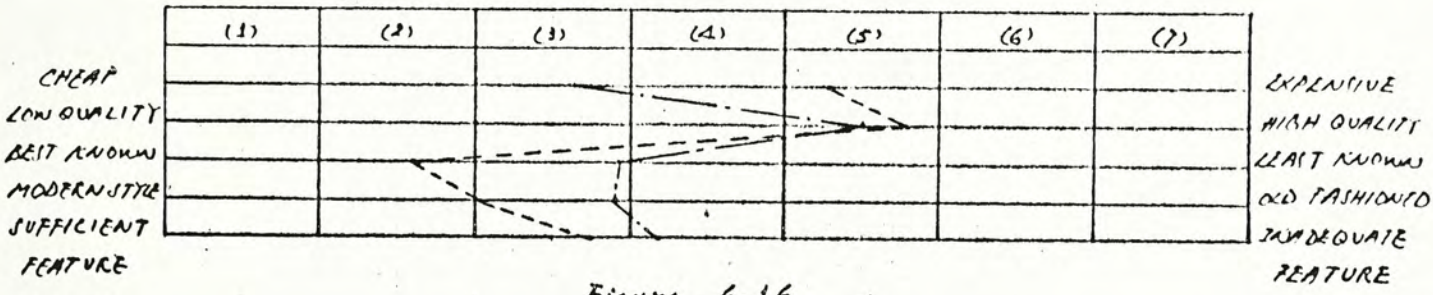

Figure 6.16

Analysis of the buying and usage pattern

(A) Usage Pattern

(i) Usage Rate - Over 75 percent of the respondents possess a calculator and 99 percent of the respondents have used a calculator before. The following table shows the statistics.

TABLE 6.6

STATISTICS OF USAGE PATTERN OF RESPONDENTS

Respondents who possess	Number
Calculator	77
No Calculator	23
Total	100

Respondents who	Number
have used calculator	99
have not used before	1
Total	100

(ii) Possession Period - None of the respondents possesses calculator for more than four years. Thirty of seventy-seven, i.e. 39 percent, have had a calculator for less than

one year while 42 percent have had a calculator for a period of one to two years. Table 6.7 shows the distribution.

TABLE 6.7

TIME OF POSSESSING CALCULATOR BY RESPONDENTS

Time	Number	Percentage
less than 1 year	30	40
1 - 2 years	32	42
2 - 3 years	12	16
3 - 4 years	2	3
Total	76	100

(B) Buying Pattern

(i) Types of calculators - There are many brands of calculators reported by the respondents with no single brand dominating the answer. The most popular brand is Sanyo, 18 percent, while Fords comes second, 13 percent, and the rest are evenly distributed among the respondents.

TABLE 6.8

TYPES OF CALCULATORS IN POSSESSION

Brand	Number	Percentage
Sanyo	12	18
Fords	9	13
Sharp	7	10
Colex	5	8
Novus	5	8
Genesonic	4	6
Casio	3	5
National	2	3
Realtone	2	3
Cannon	1	2
Others	17	25
Total	67	100

(ii) Size - Over 60 percent of respondents possess a pocket-size calculator while another 27 percent possess a hand-hold size calculator. Only 4 percent of the respondents possess a desk-top model.

TABLE 6.9

SIZE OF CALCULATORS

Size	Number	Percentage
Pocket Size	49	66
Hand-hold size	20	27
Desk-top Model	3	4
Others	2	3
Total	74	100

(iii) Place of first acknowledgement - Half of the respondents knew of their calculator brand through their friends while 15 percent were acquainted through the point of purchase promotion. It should be noted that 12 percent of the respondents knew of their calculator brand through the shopkeeper and only 11 percent through the advertisement.

TABLE 6.10

PLACE OF FIRST ACKNOWLEDGEMENT

	Number	Percentage
Friend	37	50
Point of Purchase	11	15
Shopkeeper	9	12
Advertisement	8	11
Others	9	12
Total	74	100

(iv) Place of purchase - Over 50 percent of the respondents bought their calculator from the electrical appliance retailer and 17 percent bought directly from the manufacturer. It is interesting to note that over 20 percent of them engage in group buying through their student society. The remaining 7 percent bought from department stores.

TABLE 6.11

PLACE OF PURCHASE

Place	Number	Percentage
Retailer	39	55
Department Store	5	7
Manufacturer	12	17
Group Buying	15	21
Total	71	100

(v) Area of purchase - The respondents bought their calculator mainly from two districts, namely central (23%) and Yaumati including Mong Kok (27%), giving a total of 50 percent. Another major area of purchase was through the student society (26%). Tsimshatsui and Wanchai including Causeway Bay have only 5 percent and 8 percent respectively.

TABLE 6.12

AREA OF PURCHASE

Area	Number	Percentage
Central	15	23
Yaumati	18	27
Wanchai	5	8
Tsimshatsui	5	5
Group Buying	17	26
Others	8	12
Total	66	100

(vi) Calculator brands in second purchase - The most favourable brand of calculator for the second purchase is Hewlette - Packart, comprising 17 percent of the respondents. The next favorite is Realtone which has 15 percent of respondents. Sanyo and National both have 13 percent of respondents who consider buying these brands for the second purchase. Table 6.13 shows the percentage of respondents who possess a particular brand and the percentage of respondents who wish to buy for the second purchase.

TABLE 6.13

PERCENTAGE DISTRIBUTION OF CALCULATOR BRANDS IN FIRST AND SECOND PURCHASE

Calculator Brand	First Purchase		Second Purchase	
	Number	Percentage	Number	Percentage
Cannon	1	2	2	4
Casio	3	5	-	-
Colex	5	8	1	2
Fords	9	13	1	2
Genesonic	4	6	2	4
Hewlett-Packard	-	-	8	17
National	2	3	6	13
Novus	5	8	1	2
Realtone	2	3	7	15
Sanyo	12	18	6	13
Sharp	7	10	1	2
Texas Instruement	-	-	3	6
Total	50	100	38	100

(vii) Reasons in second purchase - The most frequently reported reason for buying a particular brand for the second purchase is the features/functions possessed by that brand. The second major reason is the good quality of the calculator brand while the third factor is due to low price. Table 6.14 shows the percentage distribution.

TABLE 6.14

REASONS IN SECOND PURCHASE

Reasons	Number	Percentage
Good Feature	18	32
Good Quality	11	20
Low Price	10	18
Brand Image	9	16
Style	2	4
Easy Operation	2	4
Size	1	2
Power	1	2
Others	8	14
Total	56	100

6.3 Comparison of the Perceptions of Calculators between Consumers and Retailers

Comparison of the ranking of product attributes

Combining tables 6.2 and 5.2, table 6.15 shows the respective ranking of the factors in buying a calculator. It is noted that the three groups all consider the attributes of the product as important factors in buying a calculator with nothing mentioned on the other marketing stimulus like promotions and distribution channel.

TABLE 6.15

RANKING OF FACTORS FOR BUYING A CALCULATOR

Ranking	Factor		
	Consumer	Retailer	Manufacturer
1	Price	Price	Price
2	Feature	Brand Image	Quality
3	Style	Style	Feature
4	Brand Image	Feature	Style
5	Easy Operation	Suitable Size	Brand Image
6	Suitable Size	-	-
7	Quality	-	-
8	Convenient Power Source	-	-

All the three groups consider competitive or low price as the most important factor in buying a particular calculator. However, good feature is ranked second by consumers, fourth by retailers and third by manufacturers. Style is ranked third by consumers and retailers while it is only ranked fourth by manufacturers. It is quite interesting to note that the consumer ranks quality in seventh place while the manufacturers rank it as high as second. Also, the consumer mentions the factor of easy operation which both the retailers and manufacturers do not mention.

From the above analysis it can be concluded that all the three groups are conscious of the price feature and the style of calculator

which are the qualifying factors in choosing a calculator. However, the determining factors are quite different in the three groups.

Comparison of the Semantic Differential Pattern

The semantic differential patterns of the selected brands of calculators by users, non-users, and retailers are shown in Figure 6.10 - 6.16. Let us discuss the various perceptions of these three groups with regard to calculators.

(i) Cannon

(A) Users - It is considered as an expensive item with extremely modern-styled body. It has many features and the quality is just right. Also, the brand is not quite well known.

(B) Non-users - The calculator is quite expensive with quite high quality level. However, its feature is quite adequate and it is not quite modern-styled. The brand is not quite well known.

(C) Retailers - The calculator is expensive with quite adequate feature. Its quality is quite high and quite modern-styled. The brand is not well known locally.

From above, the non-users or potential users do not consider it as expensive as the actual users and retailers. This gives the advantage to the future potential sales of the brand since price is the most important factor in purchasing a calculator. In contrast, both the retailers and non-users consider the brand carries only quite adequate feature as compared to the users' extremely adequate feature. It seems the marketer of this brand needs more emphasis on the feature in promotion.

(ii) Casio

(A) Users - It is a cheap item but with high quality and adequate features. Also the brand is quite modern-styled and quite well known.

(B) Non-users - The calculator is quite cheap with quite low quality but quite insufficient features. The brand is quite old-fashioned and is not well known.

(C) Retailers - It is cheap with high quality and adequate feature. The brand is modern styled and is well known.

We can observe the sharp differences in perception between the users and non-users on the quality of the brand. Also, the non-users hold different perceptions on the brand image than the users and retailers. However, as long as they regard the brand as a cheap item, the potential sales of Casio is expected to increase.

(iii) Colex

(A) Users - The calculator is considered a cheap item with adequate features but with high quality level. The brand is modern styled and is well known locally.

(B) Non-users - It is cheap with inadequate feature and low quality. The brand is modern styled and is well known.

(C) Retailers - It is a cheap item with inadequate feature and low quality. The brand is not well known and is old fashioned.

It is interesting to note that the users and non-users agree on the five attributes except quality. And there are differences between the retailers and the consumers on all the

five attributes. This indicates the retailers do not understand the strengths and weaknesses of the brand and this affects future sales of the brand.

(iv) Fords

(A) Users - The calculator is a cheap item with adequate feature and low quality standard. It is modern styled and well known locally.

(B) Non-users - The calculator is cheap and carries sufficient features. However, it has a low quality standard. The brand is modern styled but is not well known.

(C) Retailers - The calculator is cheap and carries inadequate features. Also it has low quality standard and is old fashioned. The brand is not well known.

We can see that the retailers have a pessimistic view about this calculator. The ratings on quality, feature, styling and brand image are unfavourable. However, both the users and non-users hold contradicting opinion. It is expected that the future of this calculator is not as dim as the retailers anticipate.

(v) Realtone

(A) Users - The calculator is regarded as an expensive item with extremely inadequate feature and old fashioned body design. However, the brand has high quality and is well known locally.

(B) Non-users - The brand is expensive to buy but it carries sufficient features. The quality level is also high. It has a modern styled body and is well known.

(C) Retailers - It is expensive but it carries sufficient features and the quality is high. The brand is modern styled and quite well known.

The fact that the users give unfavourable remarks on the attributes of the calculators endangers the future sales of this brand. It is because the users will diffuse their opinions to the non-users and thus affect the perception of the non-users. This diffusion of opinion is extremely important as the advice of friends and relatives plays an important part in the selection process.

(vi) Sanyo

(A) Users - The calculator is quite expensive but it carries sufficient features and its quality is high. However the brand is not well known.

(B) Retailers - It is expensive but it carries sufficient features and its quality is high. The brand is modern styled and is extremely well known locally.

Both the users and retailers have similar perceptions on the attributes of the calculator except for the brand image. This indicates the consumers are now facing so many brands of calculators that this brand is no longer the single brand that appeals to them.

(vii) Sharp

(A) Users - The calculator is cheap and it carries adequate features. The quality level is also high. The brand is modern styled and it is well known.

(B) Retailers - The calculator is expensive and it carries sufficient features. The quality of this brand is extremely high. It is also modern styled and is well known.

The retailers give favourable ratings on the attributes of this calculator. However the users' ratings are not as favourable as the retailers. This implies the strengths of the calculator are being eroded away in the competition of the calculator markets.

Comparison of the distance measures die of retailers and consumers

The distance matrix between the five calculators brands for consumers is shown in table 6.16, while the distances matrix between the seven calculator brands for the retailers is shown in table 6.17. From these two matrices, we can get a semantic structure of the calculators, giving the distances or similarity relations among calculators.

TABLE 6.16

DISTANCE BETWEEN CALCULATORS FOR CONSUMERS

	1 Cannon	2 Casio	3 Colex	4 Fords	5 Realtone
1. Cannon	0.00				
2. Casio	3.64	0.00			
3. Colex	3.65	3.22	0.00		
4. Fords	2.98	2.17	2.62	0.00	
5. Realtone	2.58	5.09	3.79	4.55	0.0

TABLE 6.17

DISTANCE BWTWEEN CALCULATORS FOR RETAILERS

	1 Cannon	2 Casio	3 Colex	4 Fords	5 Realtone	6 Sanyo	7 Sharp
1. Cannon	0.00						
2. Casio	2.11	0.00					
3. Colex	3.86	2.90	0.00				
4. Fords	4.25	3.27	2.71	0.00			
5. Realtone	1.18	1.56	3.62	3.89	0.00		
6. Sanyo	2.50	2.89	5.29	6.01	2.45	0.00	
7. Sharp	1.72	2.51	4.54	5.47	1.86	1.08	0.00

From Table 6.16 we can see that Cannon is perceived to be similar to Realtone. The distance between them is 2.58. They are perceived to be dissimilar to Casio and Colex, the distances between them are 3.64 and 3.65 respectively. Fords is somewhere between Cannon and Realtone and they are substitutes for each other while the competitions between Cannon and Casio, Cannon and Colex are not so keen and are along different lines.

Casio is perceived very much the same as Fords, the distance between them is 2.17. There exists keen competition between these two calculators. As we recall from Section 6.3, they are both perceived as low priced products. However, Casio is very dissimilar to Realtone and Fords is somewhere in between; the distances between Casio and Colex, and Casio and Fords are 3.22 and 2.17 respectively.

The distance between Colex and Fords is 2.62 while distance between Colex and Realtone is 3.79. Thus it is expected that consumers tend to treat Colex and Fords alike and distinguish Colex from Realtone.

The distance between Fords and Realtone is 4.55 which is quite far apart. And Fords is perceived as quite dissimilar to Realtone.

From Table 6.17 we can see that the calculators are perceived by the retailers differently from the consumers' perception. Cannon is perceived to be very similar to Realtone and Sharp while it is perceived quite dissimilar to Fords. This indicates that Cannon has to strongly compete with Realtone and Sharp.

Casio is perceived to be quite similar to Realtone but dissimilar to Fords. Thus, the chief competitor of Casio will be Realtone.

Colex stands at a distinct position in the semantic space as no other calculator is similar to it. The nearest competitor is Fords, situating at distance of 2.71 from it. Such situation can be advantageous or disadvantageous. If Colex was considered as a good product then it would have large demand with no competitor. However, if it was perceived as undesirable product then it would be out of competition.

There is a great distance between Fords and Sanyo, and Fords and Sharp. This suggests that the retailers view Fords as a completely different product from Sharp and Sanyo. However, Fords and Colex is viewed as somewhat similar and the distance between them is 2.71.

Realtone is perceived by the retailers to be very similar to Sharp. The distance between them is only 1.86. It is also true for Cannon and Casio, the distance between them are 1.18 and 1.56 respectively. Thus Realtone is expected to have three major competitors competing among each other along the same line including quality, price, feature and body design.

Sanyo is perceived to be nearly identical to Sharp and the distance between them is the shortest of all pairs (1.08). Thus Sanyo and Sharp will compete each other along the same line and perhaps for the same customers.

7.0 CONCLUSIONS AND RECOMMENDATION

Given the exploratory character of this study, the samll sample size of the retailers together with such high non-response rate, this present study, nevertheless, provides some insight into the problems discussed in chapter one. Furthermore, a few implications and conclusions can be gathered and some recommendations are given in the following sections.

7.1 Perceptions on the Selected Calculator Brands

From the results obtained by the analysis of the semantic differentials of the calculators, it is very obvious that there are perception discrepancies among the retailers, the users and non-users. However, the degree of the discrepancies varies from brand to brand. The typical examples are Fords and Realtone. All the three groups (users, non-users and retailers) have similar perceptions on price and quality but have quite different perceptions on the style and feature of the calculators. This implies that the Marshallian Economic Model suggested by Kotler[1] works better than the other models at this early stage. However it is estimated that after further development other consumer buying behaviour models may be more appropriate and this is indicated by the change of focus of competition from price to feature as well as body design in the calculator field.

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[1] Philip Kotler, Ibid., p. 82.

7.2 Importance of Attributes of Calculators

The manufacturers, the retailers and the students all agree that the overriding reasons for buying a calculator are the attributes of the calculator which consists of quality, price, feature, size, easy operation, body design, power source and brand image. However, the ranking of these attributes are quite different among the students at the times of first purchase and second purchase. At the time of first purchase, the students agree with the manufacturers and the retailers that price feature and quality are regarded as the most important factors. This implies that the students' preference moves towards more features and higher quality with less emphasis on the price of calculators. This also reinforces the fact that the economic model only works at the early stage but losses its importance to other models as further development continues. Also from this result it is believed that the manufacturers and retailers know the qualifying factors for student buying, which are price, quality and feature. However, they do not show exactly what is the determining factors, which they cite brand image, style and size.

7.3 Segmentation Basis

The manufacturers and the retailers do not appreciate the demographics and socioeconomics variables in segmenting the market. However, they still consider age, income, education and occupation as the major segmentation variables. Also they both consider that the using of product attributes to segment the market is very useful especially the price, quality, feature, body design and display design. This means that in the process of identifying target market, the

manufacturers and retailers shift away from consumer characteristics to product characteristics, i.e. they do not identify their target markets as a certain age group with a particular occupation living in a certain area. Instead, they identify them as all those customers who like to buy a low price product with a certain level of quality and certain features. This implies that the manufacturers and retailers will look at the people in the student market as price - conscious, quality-conscious and feature-oriented and will try to adjust these variables to suit the various segments of the market. Thus the manufacturers and retailers shift away from the socioeconomic and demographic segmentation variables toward the product segmentation method.

7.4 Recommendation

Market segmentation has always been recognized by the marketer as one of the important tool in the successful marketing of electronic calculators in overseas countries. However, the idea of market segmentation is at its infant stage. Most of the local firms do not thoroughly understand the concept.

In order to develop meaningful market segments and to identify target customers, the marketer must first understand the perception of the consumer for calculators. However, it seems that both local manufacturers and retailers only concentrate on a low pricing strategy without really understanding the consumer's reaction or perception. The manufacturers and retailers seem to concentrate only on the commercial market segments and neglect the student market. As the examination regulation permits the use of calculators in school, there

will be a vast market opening up for retailers and manufacturers. Retailers should be prepared for this opportunity. The way to do is to study the perceptions of the student on calculator.

From the findings of the survey, it is suggested that good body, sufficient feature and competitive pricing are the fundamental qualifying factors for entering into the student market. However, in order to penetrate the market successfully, the firm must also offer good quality, a convenient power source and adequate size. Another significant factor is the choice of distribution channel. The firms can disregard the traditional channel of distribution, i.e. through wholesaler and retailer; instead, they should concentrate on the direct selling method i.e. direct contact with the student through their student body.

The study only concentrates on the students of the universities. In order to get more understanding of the remaining students, especially the secondary school students, a more sophisticated study should be carried out with the guidelines provided by the present study.

APPENDIX A

Manufacturers of Calculators

Name and Address	Type	Interviewed
Atlas Electronics Corp. Ltd., 423 Tokwawan Road, Whole Bldg., Kowloon, Hong Kong.	Desk Top	Discontinue calculator line in 1975
Business Electronics Ltd., International Ind'l Bldg., 12th Floor, Flat A, 175 Hoi Bun Road, Kwun Tong, Kowloon, Hong Kong.	Desk Top Pocket Size	Yes
Colex Ltd., 28A Hung To Road, 6, 10 & 11th Floors, Kwun Tong, Kowloon, Hong Kong.	Desk Top Pocket Size	Yes
Collins Ind'l Co. Ltd., Kwai Hing Ind'l Bldg., 13/F., Flat A, Chun Pin St., Kwai Chung, N.T. Hong Kong.	Pocket Size	No
Continential Electronics (Far East) Ltd., How Ming Ind'l Bldg., 7th Floor, Blk. A-B, 99 How Ming St., Kwun Tong, Kowloon, Hong Kong.	Pocket Size	No
Electronic Resources Ltd., Casey Ind'l Bldg., 11th-12th Floors, 20 Wong Chuk Hang Road, Hong Kong.	Desk Top	No
Fords Electronic Products Ltd., 111 How Ming St., 1/F., Kwun Tong, Kowloon, Hong Kong	Desk Top Pocket Size	Yes

Funny Electronics Co. Ltd., Watson's Ind. Estate, 7/F., Blk. A, Watson's Road, North Point, Hong Kong.	Pocket Size	No
International Calculator Corp. Ltd., Sincere Insurance Bldg., 14/F., 4 Hennessy Road, Hong Kong.	Portable Pocket Size Desk Top	Discontinue Calculator line recently
Manfair Electronic Mfg. Co., Lee Sum Fty Bldg., 10/F., Blk I, 23-25 Sze Mei St., San Po Kong, Kowloon, Hong Kong.	Pocket Size	Discontinue Calculator line
Leader Data Ltd., 77 Hung To Road, 6/F., Kwun Tong, Kowloon, Hong Kong.	Pocket Size	Discontinue calculator line
Minerva Industries Ltd., 21 Wong Chuk Hang Rd., 3/F., Aberdeen, Hong Kong.	Desk Top Pocket Size	Yes
Promotors Ltd., 175 Hoi Bun Road, 11/F., Kwun Tong, Kowloon, Hong Kong.	Desk Top Portable	No
R.J.P. Electronics Ltd., Rm. 30 Wing Shing Bldg., 253 Queen's Road, Central, Hong Kong.	Pocket Size	No
Realtone International Ltd., 85 How Ming St., 5/F., Kwun Tong, Kowloon, Hong Kong.	Pocket Size	Yes
Sands Electronics Ltd., Rm. 1201 Pacific House, 20 Queen's Road, C., Hong Kong.	Pocket Size Desk Top	No

Sonca Industries Ltd., 34 Tai Yau St., Whole Bldg., San Po Kong, Kowloon, Hong Kong.	Portable Desk Top Pocket Size	Yes
Tabulex Ltd., 1033 Yee Kuk St., 3/F., Kowloon, Hong Kong.	Pocket Size	Yes
Tasim Industries Co., Hoover Ind'l Bldg., 15/F., Blk. A, 26 - 38 Kwai Cheong Road, Kwai Chung, Kowloon, Hong Kong.	Pocket Size	No
Victor Warne & Co. (HK) Ltd., Landwide Bldg., 10/F., 118 - 120 Austin Road, Kowloon, Hong Kong.	Pocket Size	No

Note: The firms which had not been interviewed are firms which were unwilling to be interviewed.

Source: Hong Kong Trade Development Council.

APPENDIX B

Two focus group discussions with four and siz members in each group were held before the design of the questionnaire for the consumer. The sole purpose of these focus group discussions are to get some insights into the viewpoint of the consumers. The first group consisted of two Social Science students and two Science students, all of them used and possessed a calculator. The second group consisted of three Arts students and three Business Administration students. The two Arts students did not possess calculator while one of the Business Administration students have a calculator. The two groups both contained equal number of males and females. The following are the summary of the findings of the discussions.

(a) Purpose of Using - All the members reported they use calculator for doing their home work, thus they used different models.

(b) Time of Possession - All theusers reported they bought their calculators after entering into the university, that was less than four years. In fact most of them only possessed a calculator for less than two years.

(c) Size of Calculator - All the users had and liked pocket size calculator. But one of them reported that the size of the so called pocket size was not really small enough to put into a shirt pocket or handbag. The student desired a more handy pocket size calculator.

(d) Factors affecting the choice of calculator - When the discussion on the topic began they all agreed that they would consider price as the prime factor. However, as discussion continued they report that feature, body design and their friend's advice

also played important role in the choice of calculator. They also reported keyboard, display and size are also the factors affecting their choice. But when the users were asked to consider to buy a calculator a second time, they all comment price no longer stands in such important place as their first buying. In the second buying they would combine price, design and feature together so as to give the right mix.

(e) Brand Preference - The students reported that they did not particularly like any brand they would choose any brand as long as the price, the feature and the design were suitable. It was quite interesting to note that some of the users could not mention their calculator brand. However, they reported they could identify a Japanese brand from the others but preferred the Japanese brand. The reason they gave was they had more confidence in Japanese brand since Japanese brand had been in the market for many years.

APPENDIX C

香港中文大學嶺南工商管理研究所
THE LINGNAN INSTITUTE OF BUSINESS ADMINISTRATION
THE CHINESE UNIVERSITY OF HONG KONG
SHATIN, N.T., HONG KONG

STUDENT RESEARCH PROJECTS
學生專題研究用箋

TELEPHONE: 12-612211
EXT. 400

Dear

Being a second-year student of the Lingnan Institute of Business Administration, the Chinese University of Hong Kong, I am writing my master thesis concerning the consumer markets of the electronic calculators in Hong Kong.

I am informed that your company is one of the leading firms in this line of business, your opinion in this field will be highly valuable to my research work. I shall be grateful if you would spend some time to have a talk with me. And all information received will be purely used for academic research and treated strictly confidential.

If it is convenient to you, I would ring you up later this week for further arrangement for an interview.

Yours faithfully,

KWAN Wing Hon

A Market Segmentation Study on the Electronic Calculator as a Household Product in Hong Kong

Questionnaire for Manufacturer

Name of Firm : _____

Place of Firm : _____

Date of Interview : _____

Duration of Interview : _____

Q 1 Please indicate the brands of electronic calculators that are available at your corporation. (Please check)

Adler	_____	Fords	_____	Royal	_____
Alfa	_____	General	_____	Santronic	_____
Aristo	_____	Kolvac	_____	Sanyo	_____
Cannon	_____	Monroe	_____	Sharp	_____
Casio	_____	National	_____	Silver Reed	_____
Colex	_____	Omron	_____	Standard	_____
Compex	_____	Ricomac	_____	Toshiba	_____
Crown	_____	Realtone	_____	Others	_____

Q 2 From what sources do you get your supplies?

Local manufacturers _____

Importers _____

Wholesalers _____

Manufacture yourself _____

Others _____

Q 3 Who are your customers?

Retailer _____

Wholesaler _____

Individual consumer _____

Business Concern _____

Exporter _____

Others _____

Q 4 In your opinion who are the major customers among the individual consumers in Hong Kong?

Business Executives _____

Marketing & Sales People _____

Secondary Students _____

Post-secondary Students _____

Professionals _____

Others _____

Q 5 Please indicate the five most salable brands of electronic calculators in Hong Kong.

Adler	_____	Fords	_____	Royal	_____
Alfa	_____	General	_____	Santronic	_____
Aristo	_____	Kolvac	_____	Sanyo	_____
Cannon	_____	Monroe	_____	Sharp	_____
Casio	_____	National	_____	Silver Reed	_____
Colex	_____	Omron	_____	Standard	_____
Compex	_____	Ricomac	_____	Toshiba	_____
Crown	_____	Realtone	_____	Others	_____

Q 6 What is the favorable size in your five most salable brands of electronic calculators? (Please check)

Pocket Size _____

Hand-held _____

Desk-top Model _____

Others (Please state) _____

Q 7 Can you give any reasons accounting for such high sales of the five above mentioned brands of electronic calculators: (Please mention three reasons in order of importance)

First Reason _____

Second Reason _____

Third Reason _____

Q 7A Can you indicate the comparative advantages of your products over the five above mentioned brands of electronic calculators?

_____

Q 8 What is the price range of your products electronic calculators?

From HK$ _____ to HK$ _____

Q 9 What is the terms of payment given by your firm/supplier buying electronic calculators? (Please check)

C.O.D.	_____	11-20 days	_____
ASAP Delivery	_____	21-30 days	_____
1-5 days	_____	31-45 days	_____
6-10 days	_____	Others	_____

Q 10 Do you aim at a certain target customers?

Yes _____ No _____

(a) If yes, please state your target customers?

_____

Q 11 In dividing the market of electronic calculator of final consumer in Hong Kong what do you think are the three most important factors?

First _____

Second _____

Third _____

Q 12 The following lists are possible bases for dividing a market. Please circle the number which you feel is appropriate. (The number ranges from (1) Not significant to (5) Extremely Significant)

(A) Consumer Characteristics

Region	1	2	3	4	5	6	7
Population Density	1	2	3	4	5	6	7
Age	1	2	3	4	5	6	7
Sex	1	2	3	4	5	6	7
Family Size	1	2	3	4	5	6	7
Family Cycle	1	2	3	4	5	6	7
Income	1	2	3	4	5	6	7
Occupation	1	2	3	4	5	6	7
Education	1	2	3	4	5	6	7
Religion	1	2	3	4	5	6	7
Social Class	1	2	3	4	5	6	7

(B) Products Characteristics

Quality	1	2	3	4	5	6	7
Brand Image	1	2	3	4	5	6	7
Size of Calculator	1	2	3	4	5	6	7
Weight	1	2	3	4	5	6	7
Ease of Operations	1	2	3	4	5	6	7
Features	1	2	3	4	5	6	7
Body Design	1	2	3	4	5	6	7
Maintenance Service	1	2	3	4	5	6	7
Additional Accessories	1	2	3	4	5	6	7
Energy Source	1	2	3	4	5	6	7
Keyboard Design	1	2	3	4	5	6	7
Display Design	1	2	3	4	5	6	7

Classification Information

This information is for classification purpose only and will be treated as strictly confidential, thank you.

Q 1 How long has your company been in this business? (Please check)

Below 1 year _____

1 to 2 years _____

2 to 3 years _____

3 to 4 years _____

4 to 5 years _____

Over 5 years _____

Q 2 What is the total number of employees in your corporation?

Below 5 _____

5 to 10 _____

11 to 20 _____

21 to 50 _____

51 to 100 _____

Over 100 _____

Q 3 Your company is (Please check):

Manufacturer _____

Sole Agent _____

Wholesaler _____

Retailer _____

Others _____

Q 4 How many different product model you sell/manufacture?

Below 10 items _____

11 to 20 items _____

21 to 30 items _____

31 to 40 items _____

41 to 50 items _____

Over 50 items _____

Q 5 Below is a list containing gross sales ranges identified by the letters (a) through (f). Please circle the letter which best describes the annual sales amount for your business.

a. Below 50,000

b. 50,001 to 150,000

c. 150,001 to 300,000

d. 300,001 to 500,000

e. 500,001 to 750,000

f. 750,001 to 1,000,000

g. Over 1,000,000

****

香港中文大學嶺南工商管理研究所
THE LINGNAN INSTITUTE OF BUSINESS ADMINISTRATION
THE CHINESE UNIVERSITY OF HONG KONG
SHATIN, N.T., HONG KONG

STUDENT RESEARCH PROJECTS
實用研究題目學生

TELEPHONE: 12-612211
EXT. 400

November 28, 1975

Dear Sir/Madam,

I am a graduate student of the Chinese University of Hong Kong, currently doing a research on the consumer markets of the electronic calculator in Hong Kong as my master thesis.

I am attempting to gather some factual information on the calculator markets in Hong Kong which you can only provide. Please fill out the enclosed questionnaire and return it in the postage-free envelope.

You need not sign your name, so you are assured that this survey will in no way result in further annoyance. Won't you give it a few minutes of your time right now, while it is still in your attention? Thank you.

Yours faithfully,

WHKwan

KWAN Wing-Hon

Encl.

敬啓者：本人乃香港中文大學研究生，今欲搜集有關本港電子計數機消費市場之資料，以作本人碩士論文的根據。敬希　閣下填寫問卷乙份，並放在回郵信封內寄回。

閣下無需簽署，而所供給資料，只作研究性質，本人絕對保密。　閣下的合作，本人實感非常榮幸，耑此奉懇，祈候示覆。此致

各大公司經理

一九七五年十一月廿八日

關永漢

謹啓

A Market Segmentation Study on the Electronic Calculator as a Household Product in Hong Kong

Questionnaire for retailer

Q 1 Please indicate the brands of electronic calculators that are available at your corporation. (Please check)

Adler	____	Fords	____	Royal	____
Alfa	____	General	____	Santronic	____
Aristo	____	Kolvac	____	Sanyo	____
Cannon	____	Monroe	____	Sharp	____
Casio	____	National	____	Silver Reed	____
Colex	____	Omron	____	Standard	____
Compex	____	Ricomac	____	Toshiba	____
Crown	____	Realtone	____	Others	____

Q 2 From what sources do you get your supplies?

Local manufacturers	____	Manufacture yourself	____
Importers	____	Others	____
Wholesalers	____		

Q 3 Who are your customers? (Please state the relative percentage)

Retailer	____%	Business Concern	____%
Wholesaler	____%	Exporter	____%
Individual consumer	____%	Others	____%

Q 4 In your opinion who are the major users of electronic calculators in Hong Kong?

Business Executives	____%	Post-secondary Students	____%
Market & Sales People	____%	Professionals	____%
Secondary Students	____%	Others	____%

Q 5 Can you indicate the five most salable brands of electronic calculators in Hong Kong. (Please check)

Alfa	_____	General	_____	Royal	_____
Cannon	_____	Kolvac	_____	Sanyo	_____
Casio	_____	Monroe	_____	Sharp	_____
Colex	_____	National	_____	Silver Reed	_____
Compex	_____	Omron	_____	Standard	_____
Crown	_____	Ricomac	_____	Others	_____
Fords	_____	Realtone	_____		

Q 6 What is the favorable size in your five most salable brands of electronic calculators? (Please check)

Pocket Size	_____	Desk-top Model	_____
Hand-held Size	_____	Others (Please state)	_____

Q 7 What do you think the reasons accounting for such high sales of the five above mentioned brands of electronic calculators? (Please mention three reasons)

First Reason _____

Second Reason _____

Third Reason _____

Q 8 What is the price range of the electronic calculators available at your corporations?

From HK$ _____ to HK$ _____

Q 9 What is the terms of payment given by your firm/supplier buying electronic calculators? (Please check)

C.O.D.	_____	11-20 days	_____
ASAP Delivery	_____	21-30 days	_____
1-5 days	_____	31-45 days	_____
6-10 days	_____	Others	_____

Q 10 Do you aim at a certain target customers?

Yes _____ No _____

(a) If yes, please state your target customers?

_____

Q 11 The following is list of pairs of sords or phrases ranges from one extreme to the other. Please circle the number which comes close to how you personally feel about the particular brand.

A. Cannon

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

B. Casio

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

C. Colex

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

D. Fords

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

E. Realtone

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

F. Sharp

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

G. Sanyo

Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Low Quality	1	2	3	4	5	6	7	High Quality
Cheap	1	2	3	4	5	6	7	Expensive
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

Q 12 The following lists are possible bases for dividing the market in H.K. Please circle the number which you feel is appropriate. (The number ranges from (1) Not important to (5) Extremely important)

(A) Characteristics of Customers

Region	1	2	3	4	5
Population Density	1	2	3	4	5
Age	1	2	3	4	5
Sex	1	2	3	4	5
Family Size	1	2	3	4	5
Family Cycle	1	2	3	4	5
Income	1	2	3	4	5
Occupation	1	2	3	4	5
Education	1	2	3	4	5
Religion	1	2	3	4	5
Social Class	1	2	3	4	5

(B) Characteristics of Calculators

Price Range	1	2	3	4	5
Quality	1	2	3	4	5
Brand Image	1	2	3	4	5
Size of Calculator	1	2	3	4	5
Weight	1	2	3	4	5
Ease of Operations	1	2	3	4	5
Features	1	2	3	4	5
Body Design	1	2	3	4	5
Maintenance Service	1	2	3	4	5
Additional Accessory	1	2	3	4	5
Energy Source	1	2	3	4	5
Keyboard Design	1	2	3	4	5
Display Design	1	2	3	4	5

Classification Information

This information is for classification purpose only and will be treated as strictly confidential, thank you.

Q 1 How long has your company been in this business? (Please check)

Below 1 year	_____	3 to 4 years	_____
1 to 2 years	_____	4 to 5 years	_____
2 to 3 years	_____	Over 5 years	_____

Q 2 What is the total number of employees in your corporation?

Below 5	_____	21 to 50	_____
5 to 10	_____	51 to 100	_____
11 to 20	_____	Over 100	_____

Q 3 Your company is (Please check):

Manufacturer	_____	Retailer	_____
Sole Agent	_____	Others	_____
Wholesaler	_____		

Q 4 How many different calculator models you currently sell/ manufacture?

Belwo 10 items	_____	31 to 40 items	_____
11 to 20 items	_____	41 to 50 items	_____
21 to 30 items	_____	Over 50 items	_____

Q 5 Below is a list containing gross sales ranges identified by the letters (a) through (f). Please circle the letter which best describes the annual sales amount for your business.

a. Below HK$50,000
b. HK$50,001 to HK$150,000
c. HK$150,001 to HK$300,000
d. HK$300,001 to HK$500,000
e. HK$500,001 to HK$750,000
f. HK$750,001 to HK$1,000,000
g. Over HK$1,000,000

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SHATIN, N.T., HONG KONG

STUDENT RESEARCH PROJECTS
學生專題研究用箋

TELEPHONE: 12-612211
EXT. 400

December 9, 1975

Dear Sir/Madam,

I am a graduate student of the Lingnan Institute of Business Administration, The Chinese University of Hong Kong, currently doing a research on the consumer markets of the electronic calculator in Hong Kong as my master thesis.

I am attempting to gather some factual information on the consumer market which only you can provide. Please fill out the attached questionnaire and mail it in folded form.

You need not sign your name, so you are assured that this survey will in no way result in further annoyance. Won't you give it a few minutes of your time right now, while it is still in your attention? Thank you.

Yours faithfully,

KWAN Wing-Hon

A Survey on the Consumer Market of
Electronic Calculator in Hong Kong

Q 1 Do you possess an electronic calculator? (Please check)

Yes _____ (Please go to Q 2)

No _____ (Please go to Q1a)

Q1a If no, have you ever used any calculator? (Please check)

Yes _____

No _____

(Please go to Q 12)

Q 2 How long have you been using calculator?

Less than 1 year _____

1 - 2 years _____

2 - 3 years _____

3 - 4 years _____

Over 4 years _____

Q 3 What is the brand of your calculator?

_____

Q 4 What is the size of your calculator? (Please check)

Pocket Size _____

Desk Top Size _____

Hand Held Size _____

Others _____

Q 5 Where did you first know this brand? (Please check)

Friends & Relatives _____

Advertisement _____

Point of Purchase _____

Shopkeeper _____

Others _____

Q 6 Where did you buy your calculator? (Please check)

Electrical Appliance Retailer _____

Departmental Store _____

Book Store _____

Manufacturer _____

Others (Please specify) _____

Q 7 In what district did you buy your calculator? (e.g. Central)

_____

Q 8 Can you give three reasons why you buy your particular brand of calculator? (Please state)

First Reason _____

Second Reason _____

Third Reason _____

Q 9 Can you name anything that you particularly like using this brand of calculator?

_____

Q 10 Can you indicate anything that you particularly don't like about using this particular brand of calculator?

_____

Q 11 The following is a list of pair of words or phrase that describe your particular brand of calculator. Please circle the number which comes close to your feeling that best describes your calculator.

Cheap	1	2	3	4	5	6	7	Expensive
Low Quality	1	2	3	4	5	6	7	High Quality
Easy to operate	1	2	3	4	5	6	7	Hard to operate

Small Size	1	2	3	4	5	6	7	Large Size
Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Styled	1	2	3	4	5	6	7	Old Fashioned
Heavy Energy Consumption	1	2	3	4	5	6	7	Light Energy Consumption
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature
Easy to read Display	1	2	3	4	5	6	7	Hard to read Display

Q 12 If you had the chance to buy a calculator NOW, what brand do you buy?

_____

Why? _____

Q 13 The following is a list of pair of words or phrases that describe the following brands of calculators. Please circle the number which comes close to your feeling that best describe the calculator.

A. Cannon

Cheap	1	2	3	4	5	6	7	Expensive
Low Quality	1	2	3	4	5	6	7	High Quality
Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

B. Casio

Cheap	1	2	3	4	5	6	7	Expensive
Low Quality	1	2	3	4	5	6	7	High Quality
Best Known Brand	1	2	3	4	5	6	7	Least Known Brand

Modern Style	1	2	3	4	5	6	7	Old Fashioned
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

C. Colex

Cheap	1	2	3	4	5	6	7	Expensive
Low Quality	1	2	3	4	5	6	7	High Quality
Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

D. Fords

Cheap	1	2	3	4	5	6	7	Expensive
Low Quality	1	2	3	4	5	6	7	High Quality
Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

E. Realtone

Cheap	1	2	3	4	5	6	7	Expensive
Low Quality	1	2	3	4	5	6	7	High Quality
Best Known Brand	1	2	3	4	5	6	7	Least Known Brand
Modern Style	1	2	3	4	5	6	7	Old Fashioned
Sufficient Feature	1	2	3	4	5	6	7	Inadequate Feature

Background Data

The information is used for classification only and will be treated in strict confidence. Thank you.

Q 1 Your field of study:

Arts _____

Business Administration _____

Engineering & Architecture _____

Science _____

Social Science _____

Others _____

Q 2 Your age is: _____

Q 3 Your sex is:

Male _____ Female _____

Q 4 Your marital status is:

Single _____

Married _____

Others _____

Q 5 Would you tell me the type of your residence? (Please check)

Govt. Low Cost House _____

Resettlement Areas _____

Self-owned Flat _____

Rented Flat _____

Others _____

Q 6 Including yourself how many persons are there living together in your family?

_____

Q 7 Would you tell me where do you live? (e.g. Central)

_____

Q 8 Please check the space which best represents your average monthly <u>family</u> income.

Below HK$1000 _____

HK$1001 - HK$2000 _____

HK$2001 - HK$3000 _____

HK$3001 - HK$4000 _____

HK$4001 - HK$5000 _____

Over HK$5000 _____

****

APPENDIX D

TABLE D-1

TYPES OF COMPANIES OF RESPONDENTS

Type	Number	Percentage
Sole Agent	3	13
Wholesales	2	8
Retailer	17	71
Others	2	8
Total	24	100

TABLE D-2

AGE OF RETAILERS

Age	Number	Percentage
Below 1 year	-	-
1 - 2 years	1	4
2 - 3 years	3	13
3 - 4 years	3	13
4 - 5 years	6	25
Over 5 years	11	46
Total	24	100

TABLE D-3

SIZE OF RETAILERS

Number of Employee	Number	Percentage
Below 5	2	8
5 - 10	11	46
11 - 20	5	21
21 - 50	2	8
51 - 100	3	13
Over 100	1	4
Total	24	100

TABLE D-4

NUMBER OF CALCULATOR MODELS AVAILABLE
AT THE RETAILERS

Calculator models	Number	Percentage
Below 10	7	29
11 - 20	9	38
21 - 30	7	29
31 - 40	-	-
41 - 50	-	-
Over 50	1	4
Total	24	100

TABLE D-5

ANNUAL SALES OF RETAILERS

Annual Sales in HK$1,000	Number	Percentage
500 - 750	4	17
750 - 1,000	8	33
Over 1,000	12	50
Total	24	100

TABLE D-6

AGE OF MANUFACTURERS

Age	Number	Percentage
Below 1 year	-	-
1 - 2 years	1	14
2 - 3 years	3	43
3 - 4 years	-	-
4 - 5 years	1	14
Over 5 years	2	29
Total	7	100

TABLE D-7

NUMBER OF CALCULATOR MODELS MANUFACTURED
BY MANUFACTURERS

Number of Models	Number	Percentage
Below 10	3	43
11 - 20	4	57

TABLE D-8

ANNUAL SALES FIGURE OF MANUFACTURERS

Annual Sales	Number	Percentage
HK$50,000 - HK$150,000	1	14
Over HK$1,000,000	6	86
Total	7	100

TABLE D-9

DISTRIBUTION OF FIELD OF STUDY
OF CONSUMER RESPONDENTS

Faculty	Number
Arts	7
B.A.	24
Eng. & Arch.	20
Science	25
Social Sciences	24
Total	100

TABLE D-10

DISTRIBUTION OF AGE OF
CONSUMER RESPONDENTS

Age Range	Number
Under 19	-
19 - 20	31
21 - 22	44
Over 22	25
Total	100

TABLE D-11

SEX OF CONSUMER RESPONDENTS

Sex	Number
Male	72
Female	28
Total	100

TABLE D-12

MARITAL STATUS OF CONSUMER RESPONDENTS

Marital Status	Number
Single	96
Married	3
Others	1
Total	100

TABLE D-13

TYPES OF RESIDENCE OF CONSUMER RESPONDENTS

Types of Residence	Number
Govt. L.C.H.	24
Resettlement Estate	12
Self-owned flat	28
Rented Flat	27
Others	9
Total	100

TABLE D-14

FAMILY SIZE OF CONSUMER RESPONDENTS

Number of People	Number
01 - 02	2
03 - 04	16
05 - 06	37
07 - 08	29
09 - 10	16
Total	100

TABLE D-15

PLACE OF RESIDENCE OF CONSUMER RESPONDENTS

Location	Number
Hong Kong Island	39
Kowloon	54
New Territories	7
Total	100

TABLE D-16

MONTHLY FAMILY INCOME DISTRIBUTION
OF CONSUMER RESPONDENTS

Family Income	Number
Below HK$1,000	13
HK$1,000 - HK$2,000	36
HK$2,000 - HK$3,000	31
HK$3,000 - HK$4,000	10
HK$4,000 - HK$5,000	7
Over HK$5,000	3
Total	100

TABLE D-17

PLACE OF SCHOOLING OF
CONSUMER RESPONDENTS

School	Number
Hong Kong University	47
Chinese University of Hong Kong	53
Total	100

BIBLIOGRAPHY

1. Barnett, Norman L. "Beyond Market Segmentation." Harvard Business Review, Vol. 47 (Jan. - Feb., 1969) p. 152-166.

2. Boyd, H.W., and New Jersey Westfall, R. Marketing Research, Text and Cases: Irwin Inc., 1970.

3. _____, and Massy, William F. Marketing Management, New York: Harcourt Brace, 1972.

4. Engel, James F.: Fiorillo, Henry F.; and Cayley, Murray A. eds. Market Segmentation Concepts and Applications. New York: Holt, Rinehart & Winston, Inc., 1972.

5. Frank, Ronald E. "Market Segmentation Research: Findings and Implications." Edited by James F. Engel, Henry F. Fiorillo and Murray A. Cayley. New York: Holt, Rinehart & Winston, Inc., 1972.

6. _____. "Is Brand Loyalty a Useful Bases for Market Segmentation?" Journal of Advertising Research, Vol. 7 (June 1967) p. 27-33.

7. _____, and Massy, F. William. "Market Segmentation and the Effectiveness of a Brand's Price and Dealing Policies." Journal of Business, Vol. 38 (April 1965) p. 186-200.

8. Hong Kong Government. Hong Kong 1974.

9. Hong Kong, Census & Statistics Department. Hong Kong Monthly Digest of Statistics, March, 1964.

10. Hong Kong, Census & Statistics Department. Hong Kong Monthly Digest of Statistics, March, 1974.

11. Hong Kong, Commerce & Industry Department. Industry Factory Sheet, Electronic Industry in Hong Kong, August, 1975.

12. Hong Kong, Census & Statistics Department. Hong Kong Trade Statistics, Exports and Re-Exports, December, 1964, 1970-1975.

13. Hong Kong, Census & Statistics Department. Hong Kong Trade Statistics, Imports, December, 1964, 1970-1975.

14. Kotler, Philip. Marketing Management, Analysis, Planning & Control. New Jersey: Prentice-Hall Inc., 1969.

15. Osgood, Charles E.; Suci, George J.; and Tannensaum, Percy H. The Measurement of Meaning. Urbana: University of Illinois, 1975.

16. Preston, Lee E. Market and Marketing, An Orientation. Illinois: Scott, Foresman and Co., 1970.

17. Scith, Wendell R. "Product Differentiation and Market Segmentation as Alternative Marketing Strategies." Journal of Marketing, Vol. 21 (July 1965) p. 3-8.

18. "Surge in Demand Strains the Source Market." Asian Source, Electronics, Vol. 5/No. 5, 1975, p. 9-18. Hong Kong: Trade Media Ltd., 1975.

19. Zaltman, Gerald. Marketing: Contributions from the Behavioral Sciences. New York: The Harbrace Series in Business and Economics, 1965.

20. _____, and Burger, Philip C. Marketing Research: Fundamentals and Dynamics. Illinois: Holt, Rinehart and Winston, Inc., 1975.